

# **MicroVAX 2000 Installation**

Order Number EK-MVXAB-IG-002

**digital equipment corporation  
maynard, massachusetts**

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# Contents

About This Guide . . . . .	v
Preparing Your Site . . . . .	1
Space Planning . . . . .	1
Environmental Requirements . . . . .	2
Electrical Requirements . . . . .	2
Checking Your Shipment . . . . .	3
Setting Up the System Unit . . . . .	4
Installing the Converter . . . . .	7
Installing the Console Terminal . . . . .	10
Installing the Additional Terminals . . . . .	14
Connecting the Third or Fourth Terminal to the Communications Port . . . . .	17
Installing the Options . . . . .	20
Install the Printer. . . . .	20
Notes on Printer Operation . . . . .	24
Install Additional DECconnect Office Cable Length. . . . .	24
Install the Modem. . . . .	26
Install the Expansion Boxes. . . . .	28
Connect the Tape Drive Cable. . . . .	31
Connect the Disk Drive Cable. . . . .	35
Connect the DST32 Synchronous Serial Line Option . . . . .	39
Connect the DHT32 serial line option . . . . .	44
Connect the DSH32 Synchronous/Asynchronous Serial Line Option . . . . .	50
Connecting the Power Cords . . . . .	58
Powering Up and Testing the MicroVAX 2000 System . . . . .	61
Formatting the Fixed Disk . . . . .	70
Connecting the ThinWire or ThickWire Ethernet . . . . .	75
Setting the Default Boot Device . . . . .	76
Where to Go from Here . . . . .	77
Install the Operating System Software . . . . .	77

## Index

### Tables

1	Modem Cables for Each Communication Protocol . . . . .	40
2	DST32 Data Rate for Cable Length . . . . .	40
3	Modem Cables for Each Communication Protocol . . . . .	51
4	DSH32 Data Rate for Cable Length . . . . .	52
5	Definition of Mnemonics . . . . .	69
6	Boot Device Names . . . . .	76



## About This Guide

This guide describes how to prepare your site; connect the terminals and options (printers, additional DECconnect office cable, modems, and expansion boxes) to the MicroVAX 2000 system unit; connect the power cords, power up and test the MicroVAX 2000, format the fixed disk; and set the default boot device.

Keep this guide for future reference.

## About This Documentation

This MicroVAX 2000 Hardware Information Kit contains five parts:

- *MicroVAX 2000 Installation* (This guide) explains how to install the base system and how to connect any optional equipment to the base system.
- *MicroVAX 2000 Operation* explains how to operate the MicroVAX 2000. (You should read Chapter 1 of this guide before you install your operating system software.)
- *MicroVAX 2000 Troubleshooting* provides troubleshooting tables to help you diagnose and correct problems with your system.
- *MicroVAX 2000 Technical Information* contains technical specifications for the base system and optional equipment.
- *MicroVAX 2000 Customer Services* describes the variety of services available for your equipment.

## Network Installation

For information about network installation, see the *VAXstation 2000*, *MicroVAX 2000*, and *VAXmate Network Guide* which also shipped with your system.

## Operating System Installation

For information about installing the operating system, see *MicroVMS VAXstation 2000/MicroVAX 2000 Installation Guide*

or

*ULTRIX-32 Basic Installation Guide for the MicroVAX 2000*

## Procedures

When you use this guide, perform the following procedures. Follow and complete each step sequentially.

1. Prepare your site.
2. Check your shipment.
3. Set up the system unit.
4. Install the converter.
5. Install the console terminal
6. Install any additional terminals.
7. Install any options.
8. Connect the power cords.
9. Power up and test the MicroVAX 2000.
10. Format any fixed disks.
11. Set the default boot device.

After you complete the steps above, install the networking hardware (if you ordered it) and install the operating system software.

## Conventions

This document uses the following conventions:

Convention	Meaning
Note	Provides general information on the current topic.
>>>	Console prompt
<b>Return</b>	Text within a box identifies a key, such as the <b>Return</b> key.
<b>Bold</b>	Bold print identifies user input.
VSmsv_Res_Succ	Examples of commands or other text you enter on the keyboard are shown in monospace type.

## **Related Documents**

For a list of documents and their order numbers, see the *MicroVAX 2000 Operation*, Appendix A (Related Documentation).





## Preparing Your Site

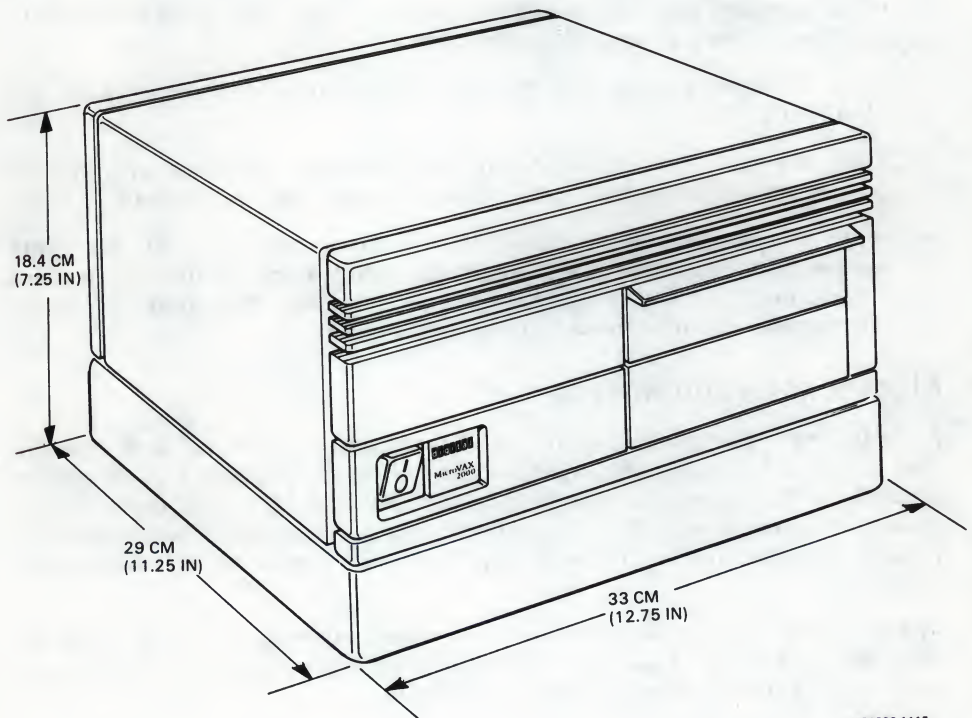
Before installing the MicroVAX 2000, review the following site-preparation requirements.

For detailed MicroVAX 2000 system specifications, refer to Appendix A of the *MicroVAX 2000 Operation*.

## Space Planning

Plan for 18 centimeters (7 inches) of clearance on all sides of the MicroVAX 2000 system unit to allow air circulation through the equipment. Do not block the vents.

The MicroVAX 2000 system unit, as shown, weighs about 14 kilograms (30 pounds).



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## Environmental Requirements

- Keep the temperature of the operating environment between 10 and 40 degrees Celsius (50 and 104 degrees Fahrenheit).
- If the system becomes cold, (for example, during transportation), allow the system to reach room temperature before operation.
- Keep the air well circulated to prevent heat from accumulating.
- Keep the MicroVAX 2000 away from heaters, photocopiers, and direct sunlight.
- Keep the relative humidity between 40 and 80 percent for proper operation of the MicroVAX 2000.
- To minimize static electricity buildup, locate the system away from busy areas, such as office corridors, and keep the environment at the recommended humidity levels. (Static electricity can cause a system to fail, data to be lost, and other problems to occur.)
- Keep the area clean. Do not place food or drinks on or near the MicroVAX 2000.
- Keep the area free of dust. (Dust particles can interfere with system cooling and damage hardware, diskettes, and tape cartridges.)
- Store supplies, such as diskettes and tape cartridges, at the same temperature and humidity levels as recommended for the system environment. (Refer to the *MicroVAX 2000 Operation* for more information on diskettes and tape cartridges.)

## Electrical Requirements

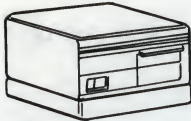
A dedicated 15-ampere branch circuit is recommended for each system. The circuit must meet national and local standards, provide a good system ground, be stable, and be free from electrical noise. If power disturbances cannot be prevented, add power-conditioning equipment. Some printers require branch circuits. Consult Digital service personnel to assess your needs.

The ac power source should allow for system expansion. Do not connect other equipment (such as air conditioners or office copiers) to the circuit dedicated to the system unit or the terminal.

## Checking Your Shipment

The key element of your MicroVAX 2000 hardware shipment is the system unit carton. The following illustration shows the contents of the system unit carton:

### MicroVAX 2000 CARTON CONTENTS



MicroVAX 2000  
SYSTEM UNIT



MicroVAX 2000  
EXPANSION BOX



MicroVAX 2000  
POWER CORD



CONVERTER



FLAT-BLADE  
SCREWDRIVER



BOTTOM  
DRESS COVER



3 DECconnect  
OFFICE CABLES  
(PART NO. BC16E)



3 25-PIN ADAPTERS  
(PART NO. H8571A)

### HARDWARE INFORMATION KIT



*MicroVAX 2000 HARDWARE  
DOCUMENTATION*



*VAXstation 2000, MicroVAX2000  
AND VAXmate NETWORK GUIDE*



25-PIN TERMINAL CABLE  
(PART NO. BC22D)



25-PIN MODEM CABLE  
(PART NO. BCC04)



## **4 MicroVAX 2000 Installation**

Unpack your shipment and check to see that you have received all the items pictured. In addition, check your shipment against the packing slip.

### **NOTE**

The cable-restraining bar on the back of the MicroVAX 2000 system unit can be used as a handle when unpacking and carrying the unit.

### **CAUTION**

Do not set the MicroVAX 2000 system unit on its front, as this may damage the drive door.

You may have received additional items. Terminals, printers, expansion boxes, and Ethernet hardware are packaged separately. Other options, such as the memory module and network module come preinstalled in the system unit. Operating system software is shipped in a separate carton along with the operating system software documentation.

If your shipment is damaged or if any item that you ordered is missing, inform the delivery agent and contact your sales representative.

Save all packing boxes in case you change locations or need to send back parts of the system for repair.

## **Setting Up the System Unit**

You may set up the MicroVAX 2000 on its bottom rubber feet or on its side (either side).

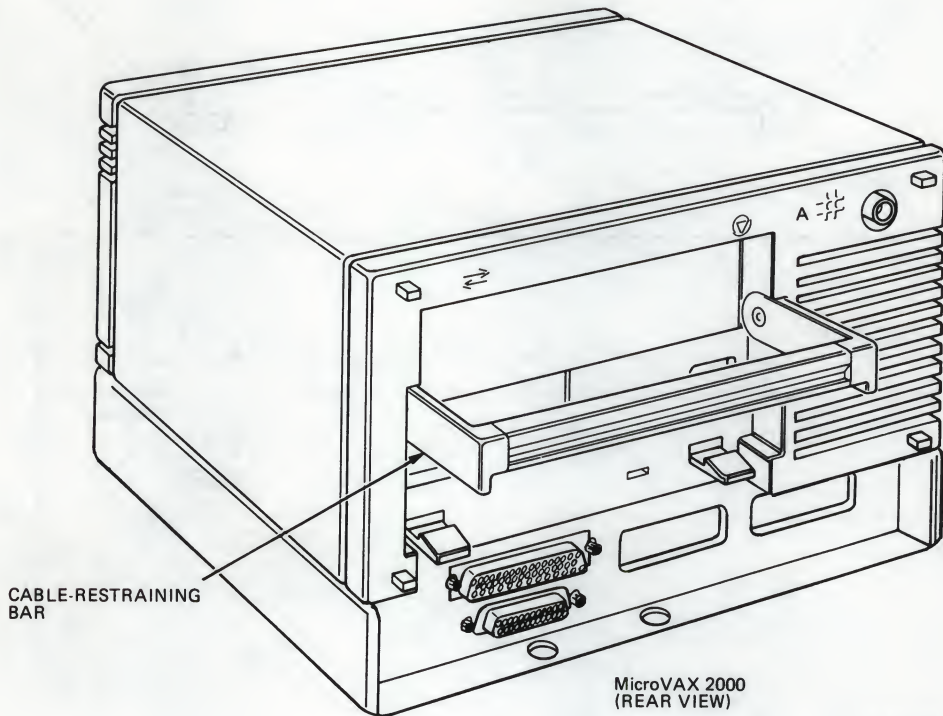
### **NOTE**

The cable-restraining bar on the back of the MicroVAX 2000 can be used as a handle when unpacking and carrying the system unit.

### **CAUTION**

Do not set the MicroVAX 2000 system unit on its front, as this may damage the drive door.



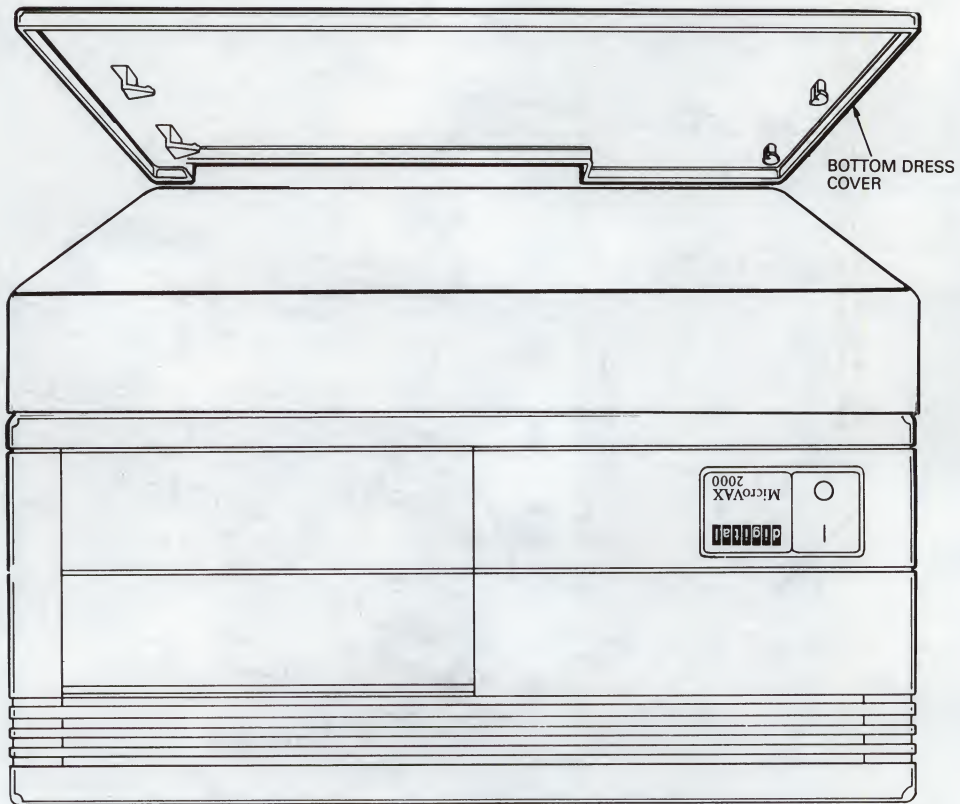


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If you choose to set up the MicroVAX 2000 system unit on its side, you must install the bottom dress cover. To install the bottom dress cover, do the following:

1. Place the MicroVAX 2000 system unit upside down on a level surface.
2. Locate the bottom dress cover.
3. Line up the molded inserts on the inside of the bottom dress cover over the holes on the bottom of the MicroVAX 2000 system unit. Then slide the bottom dress cover until it locks into place.

## 6 MicroVAX 2000 Installation



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4. Place the MicroVAX 2000 system unit in one of the recommended positions on a level surface.

## Installing the Converter

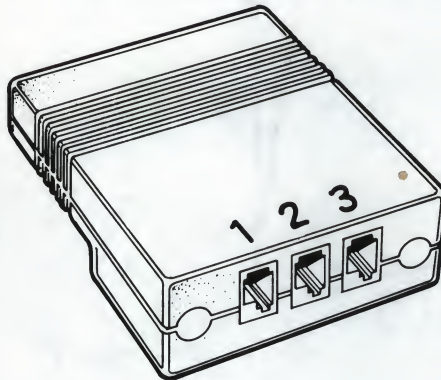
### CAUTION

When installing the DEC423 converter to the rear of the MicroVAX 2000 system unit, do not place the system unit on its front, as the drive door may be damaged.

1. Locate the DEC423 converter.

### NOTE

The converter contains three jacks where you can install serial lines for devices like printers and video terminals.



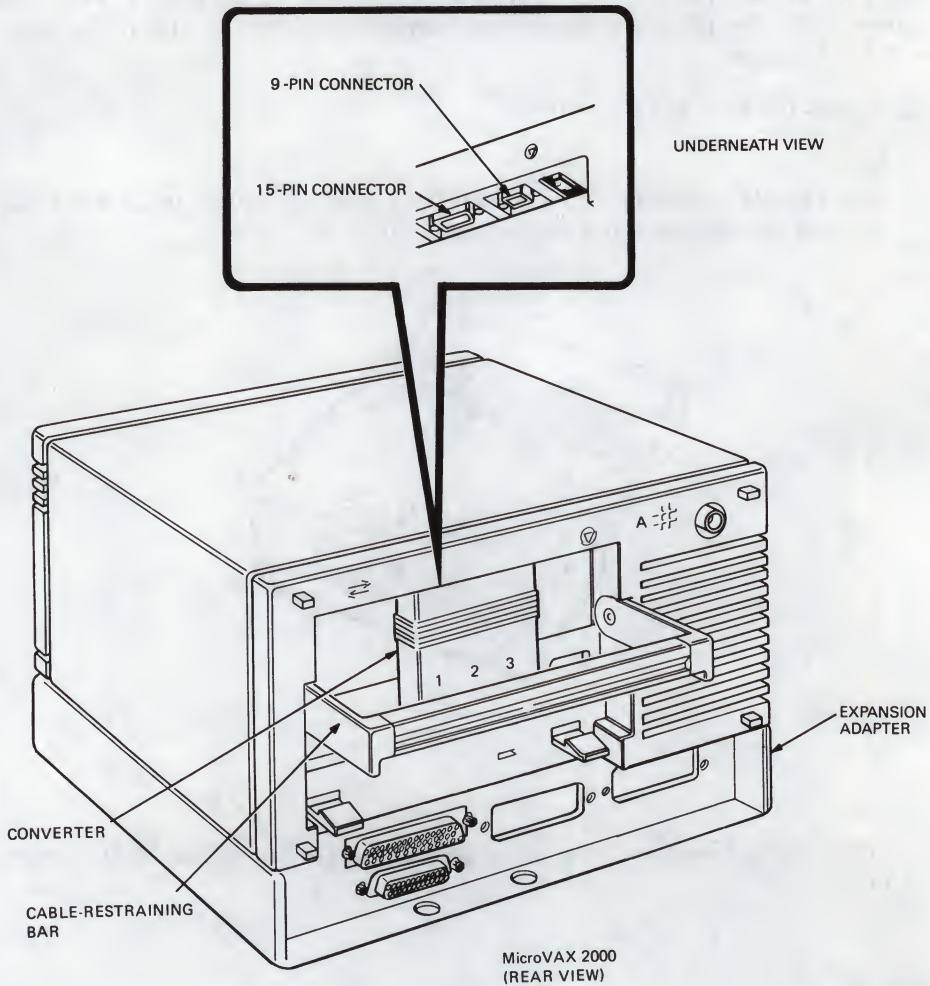
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2. Lift up the cable-restraining bar on the rear of the MicroVAX 2000 system unit.



## 8 MicroVAX 2000 Installation

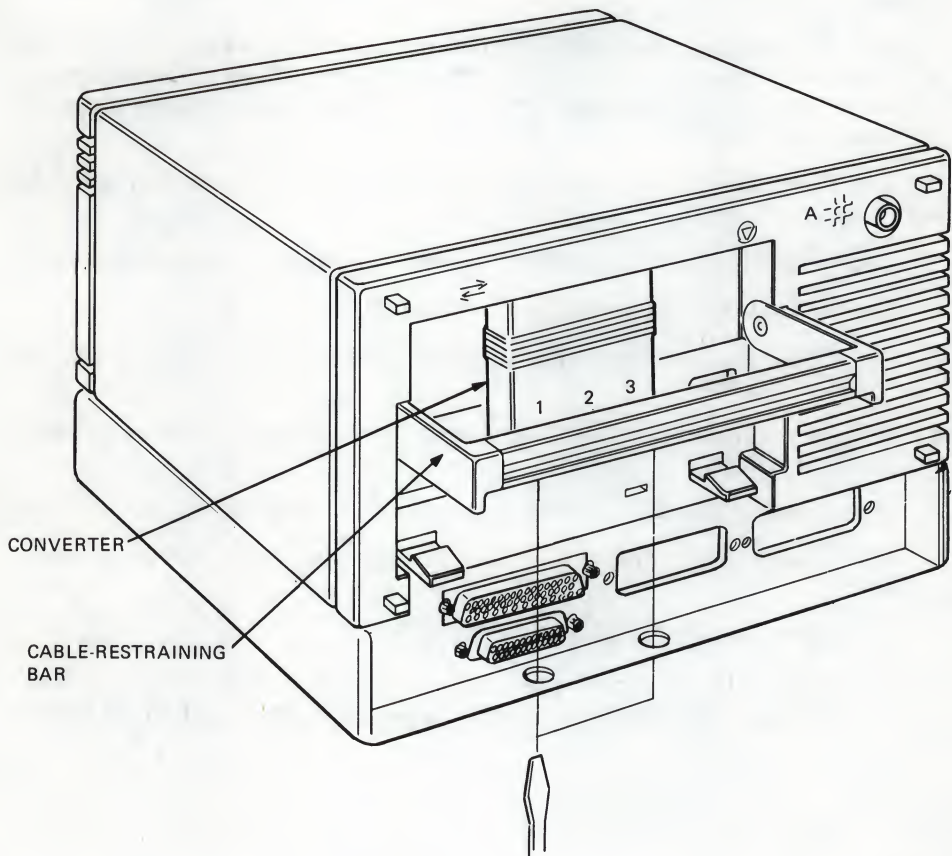
3. Fit the DEC423 converter over the 15-pin and 9-pin connectors and press it into place.



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4. Insert the flat-blade screwdriver you received with your shipment through the holes in the bottom of the expansion adapter and turn the two screws on the DEC423 converter clockwise.



## Installing the Console Terminal

This section and the following section describe how to connect VT300-series and VT200-series terminals to the MicroVAX 2000 system unit. If you want to connect different terminals, the installation procedure may vary from the following steps.

Digital's VT300-series terminals do **not** require the use of a DECconnect adapter. To connect each VT200-series terminal, you need a 25-pin adapter and a DECconnect office cable. Contact your sales representative if you do not have these parts.

Refer to the documentation that shipped with the terminal to complete the following procedures:

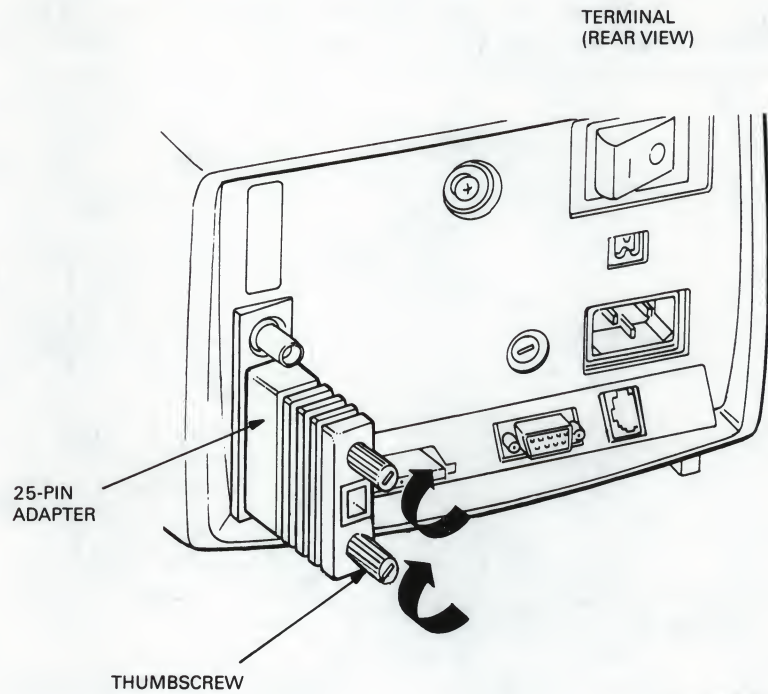
1. Locate and set up the terminal you want to connect to the system unit.
2. Set the keyboard language for the terminal.
3. Set the terminal's baud rate to 9600 to match the baud rate of the MicroVAX 2000.
4. For systems running ULTRIX operating system software, set the terminal for 7-bit ASCII.

If you are connecting a VT300-series terminal, skip to step 5.

If you are connecting a VT200-series terminal, first complete these steps.

- a. Locate the 25-pin adapter (PN H8571A).
- b. Connect the 25-pin adapter to the 25-pin connector on the rear of the terminal. The VT220 terminal's 25-pin connector is labeled COMM.

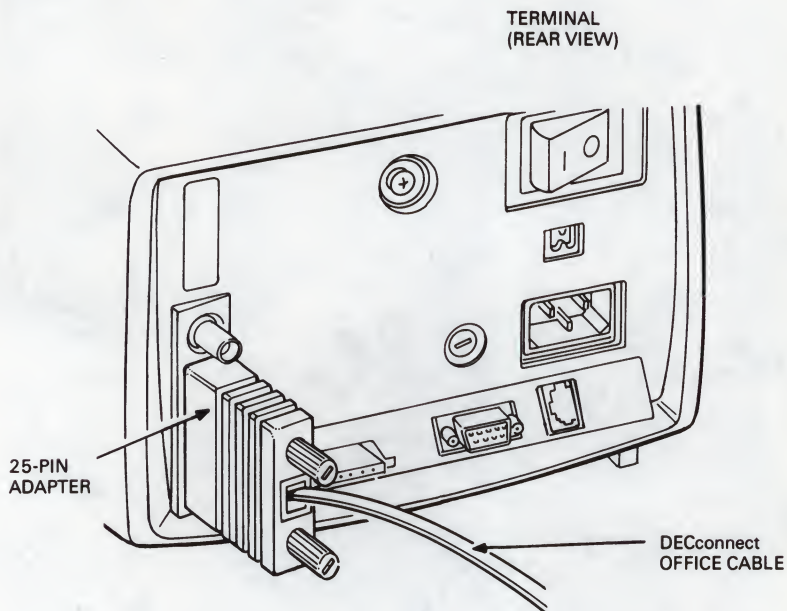
- c. Tighten the thumbscrews on the 25-pin adapter with your fingers.



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## 12 MicroVAX 2000 Installation

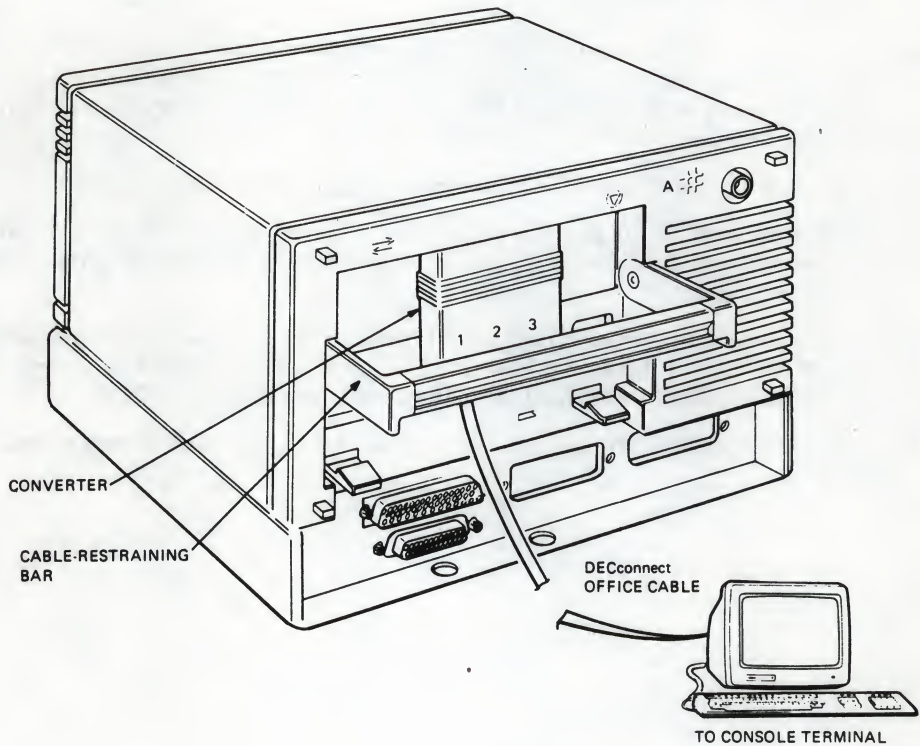
5. Locate the DECconnect office cable (PN BC16E).
6. Connect one end of the DECconnect office cable to the 25-pin adapter on the VT200-series terminal or to the 6-pin communication port on your VT300-series terminal. (The two ends of the DECconnect office cable are identical and, therefore, interchangeable.)



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7. Raise the cable-restraining bar on the MicroVAX 2000 system unit if it is not already raised.
8. Insert the free end of the DECconnect office cable to connector 1 on the DEC423 converter.



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The terminal that you have just connected is called the console terminal. The console terminal allows the user to control certain system functions and to access diagnostic programs that reside in the system. The console terminal must be connected to connector 1 on the DEC423 converter.

#### NOTE

For a MicroVAX 2000 to function correctly, a console terminal must be connected.

## Installing the Additional Terminals

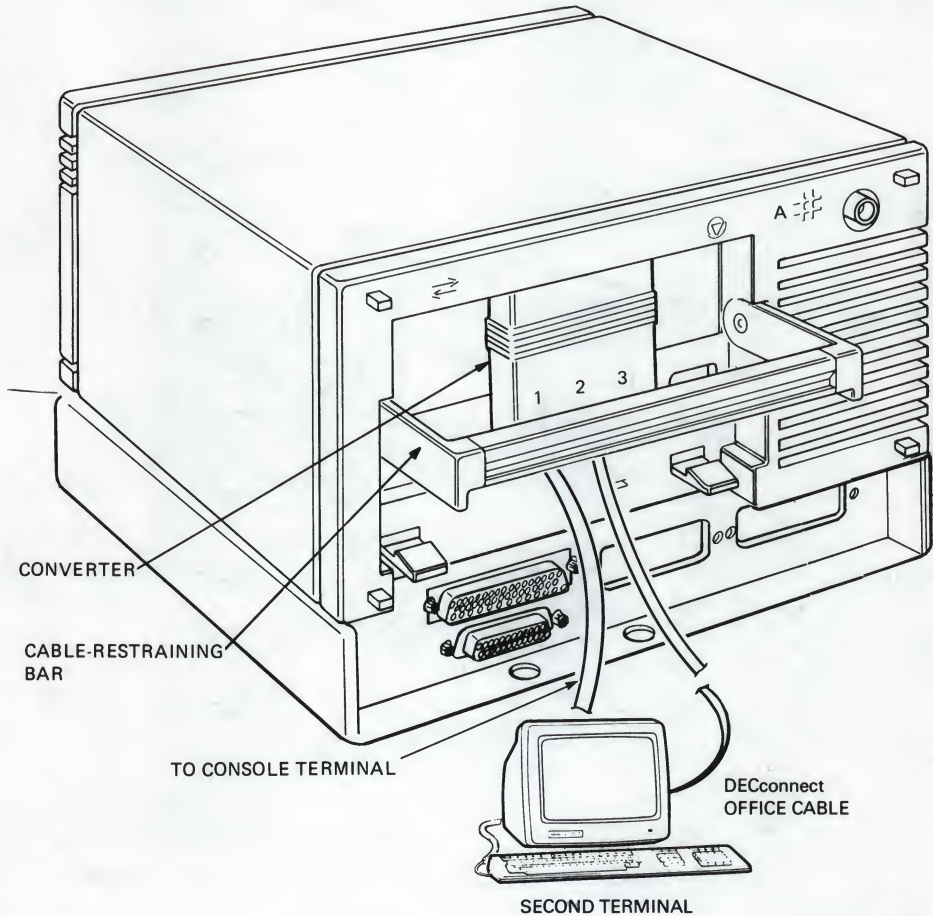
It is possible to install a total of four terminals on the MicroVAX 2000 system unit. Perform the following steps to install the additional three terminals.

1. Set up the terminals using the first four steps in *Install the Console Terminal*.
2. If you are connecting a VT300-series terminal, connect one end of a DECconnect office cable to the 6-pin communications jack at the rear of the second terminal. (The two ends of the DECconnect office cable are identical and, therefore, interchangeable.)

If you are connecting a VT200-series terminal, follow these steps.

- a. Connect a 25-pin adapter to the 25-pin connector on the rear of the second terminal and tighten the thumbscrews on the adapter with your fingers.
  - b. Connect one end of a DECconnect office cable to the 25-pin adapter on the rear of the second terminal. (The two ends of the DECconnect office cable are identical and, therefore, interchangeable.)
3. If the cable-restraining bar on the rear of the system unit is not raised, lift it up.

4. Connect the free end of the second terminal's DECconnect office cable to connector 2 on the DEC423 converter.

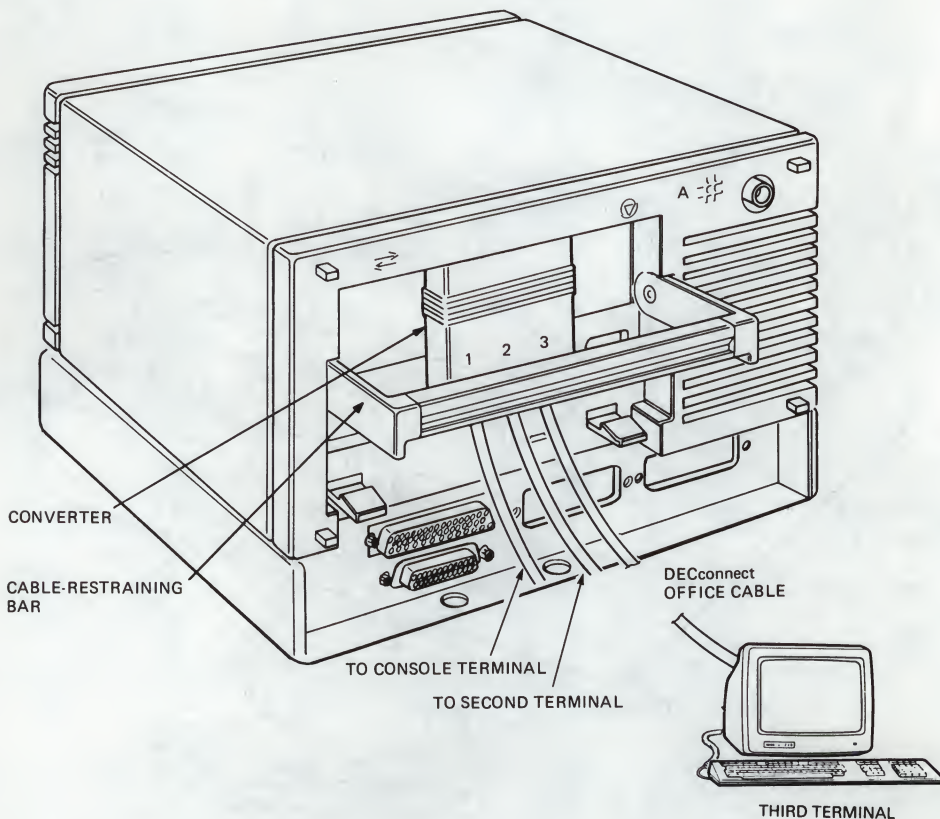


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If you do not plan to install any additional terminals, proceed to Installing the Options. If you do not have any options to install, proceed to Connecting the Power Cords.



Before you install a third terminal, first consider whether you will also be installing a printer. If you do not plan to install a printer, set up the third terminal using the same procedure as the second terminal. Connect the third terminal to connector 3 of the DEC423 converter.



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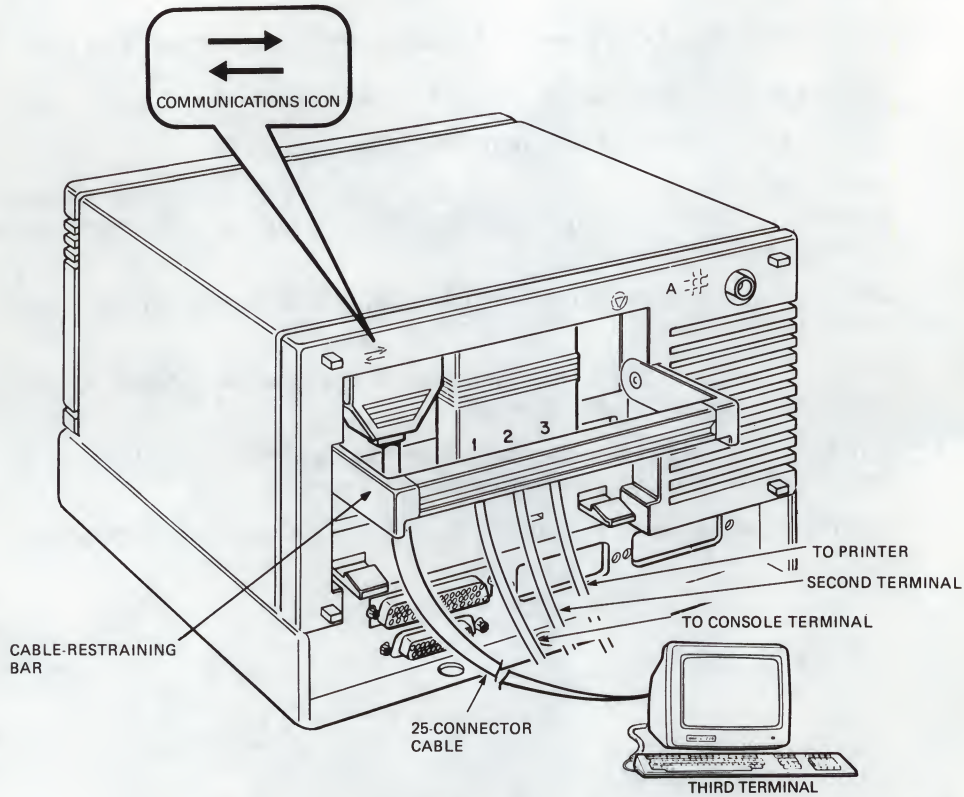
If you plan to install a printer, complete the steps in Connecting the Third or Fourth Terminal to the Communications Port. However, if you plan to install a modem in addition to a printer, you cannot install a third or fourth terminal.

### **Connecting the Third or Fourth Terminal to the Communications Port**

1. Set up the terminal as usual, but do not install a 25-pin adapter.
2. Locate the 25-conductor terminal cable (PN BC22D).
3. Insert one end of the terminal cable into 25-pin connector on the terminal. (The two ends of the cable are identical and, therefore, interchangeable.)
4. Use a flat-blade screwdriver to tighten the two screws on the cable connector clockwise.
5. If the cable-restraining bar on the rear of the MicroVAX 2000 system unit is not already raised, lift it up.
6. Insert the free end of the 25-conductor cable into the port on the rear of the MicroVAX 2000 labeled with a double-arrow icon.
7. Use the screwdriver to tighten the two screws on the cable connector.

## 18 MicroVAX 2000 Installation

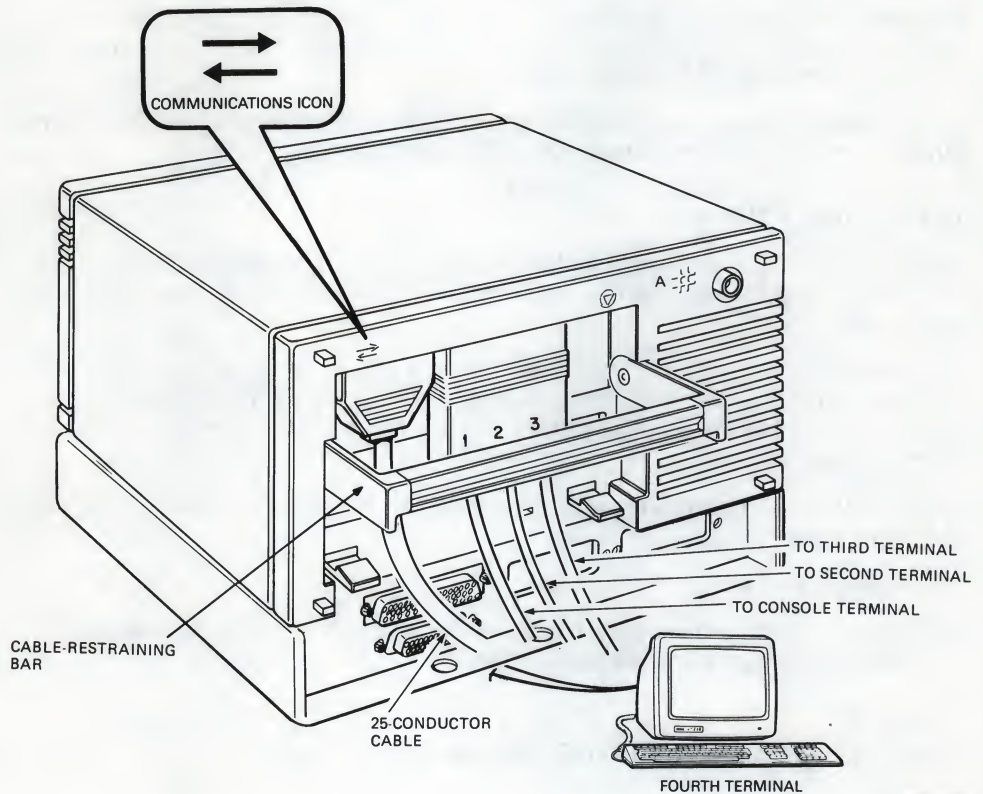
The following illustration shows the third terminal connected to the communications port.



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The following illustration shows the fourth terminal connected to the communications port.



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Proceed to Installing the Options. If you do not have any options to install, proceed to Connecting the Power Cords.

## Installing the Options

To install a printer, additional DECconnect office cable length, a modem, or expansion box cables, follow the instructions in this section under the option you are installing. The options can be installed in any order; however, it is easiest to install the expansion box(es) last.

If you order the memory module after the initial shipment, contact your Digital service representative to install these items.

### Install the Printer.

This section describes how to install the following Digital printers: the LN03, LN03 PLUS, and laser printers, and the LA210, LA100, LA75, and LA50 dot-matrix printers.

In addition to the printer, you must order a DECconnect office cable (PN BC16E) and the 25-pin adapter (PN H8571A). (However, the 25-pin adapter is not needed for the LA75 printer). Contact your sales representative for these items.

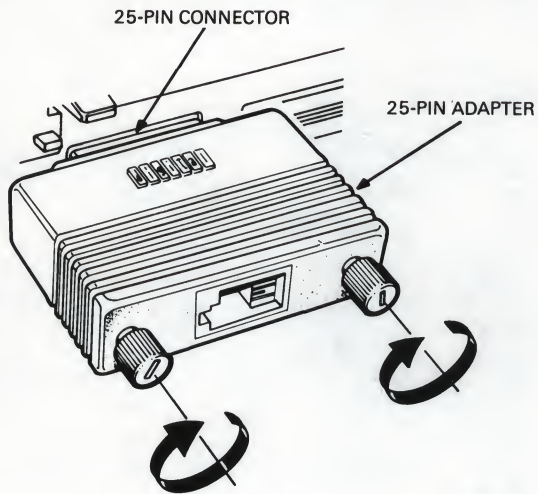
Refer to the documentation that shipped with the printer to complete the following procedures.

1. Unpack and set up the printer.
2. Make sure that the on/off switches for the printer and the MicroVAX 2000 system unit are set to off (O).

#### NOTE

If you are installing an LA75, skip the next two steps.

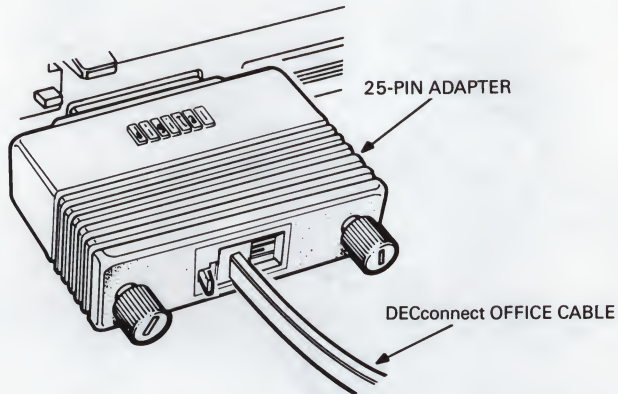
3. Locate the 25-pin adapter (PN H8571A).
4. Connect the 25-pin adapter to the 25-pin connector on the rear of the printer.



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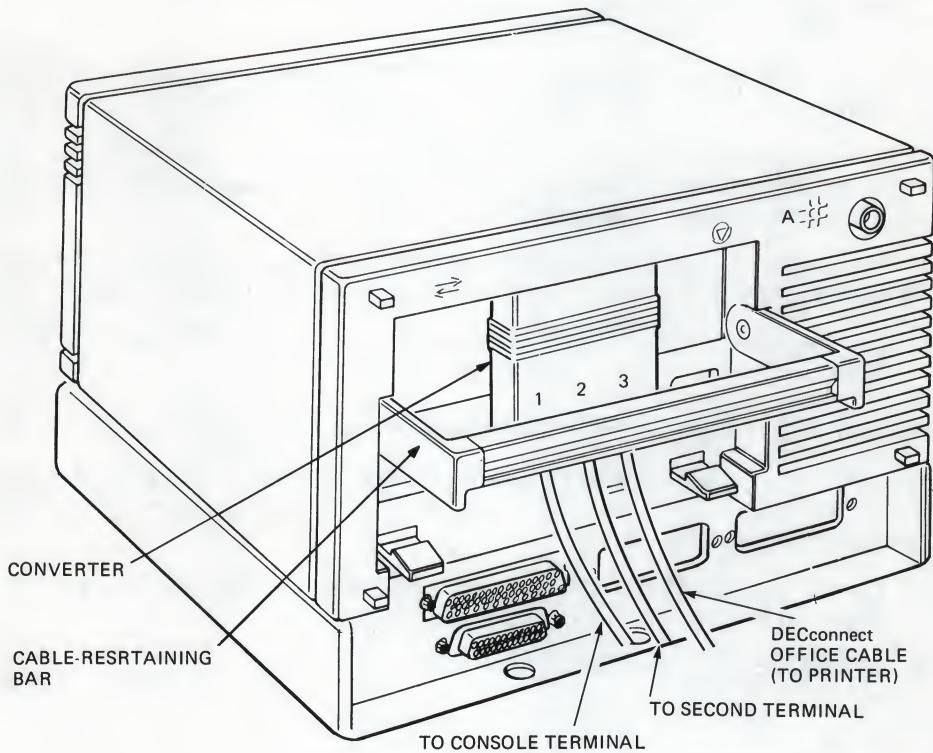
5. Locate the DECconnect office cable (PN BC16E).
6. Plug one end of the DECconnect office cable into the 25-pin adapter on the rear of the printer. If you are installing an LA75, plug the cable directly into the connector on the back of the printer. (The two ends of the DECconnect office cable are identical and, therefore interchangeable.)



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7. If the cable-restraining bar on the rear of the MicroVAX 2000 system unit is not already raised, lift it up.

8. Connect the free end of the DECconnect office cable into either the second or third connector on the DEC423 converter. (If neither connector is free, you must remove the terminal that is connected to the third connector to install the printer.)



## Notes on Printer Operation

- Make sure that the printer's baud rate is set to 9600.
- For systems running ULTRIX operating system software, set the printer for 7-bit ASCII. (Refer to the documentation that shipped with the printer to set 7-bit ASCII.)
- The LA210 printer requires that the XOFF and wrap be enabled. (Refer to the LA210 documentation for switch-toggling information.)

After you have properly completed all the instructions in this guide and successfully installed the operating system software, complete the following procedures for proper operation of the printer:

- Refer to the operating system software documentation to define the printer port as the connector where you attached the printer cable.
- For systems running ULTRIX operating system software, run LPR setup. Refer to the *ULTRIX-32 System Management Guide*.

## Install Additional DECconnect Office Cable Length.

To extend the length of any DECconnect office cable, do the following. If you do not have the optional items mentioned, you must order them from your sales representative.

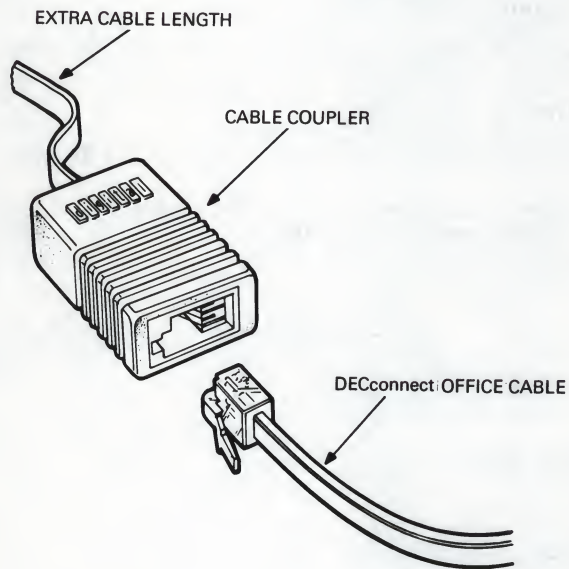
1. Locate the additional DECconnect office cable. This cable comes in different lengths.
2. Locate the cable coupler (PN H8572).



3. Insert one end of the additional DECconnect office cable into either side of the cable coupler.
4. Insert one end of the terminal's or printer's DECconnect office cable into the free end of the cable coupler. (You can install as many cable couplers as you have cable segments.)

**NOTE**

If you want to shorten DECconnect office cable, use a crimping tool. This tool can be ordered from your Digital sales representative. Follow the instructions that come with the crimping tool.



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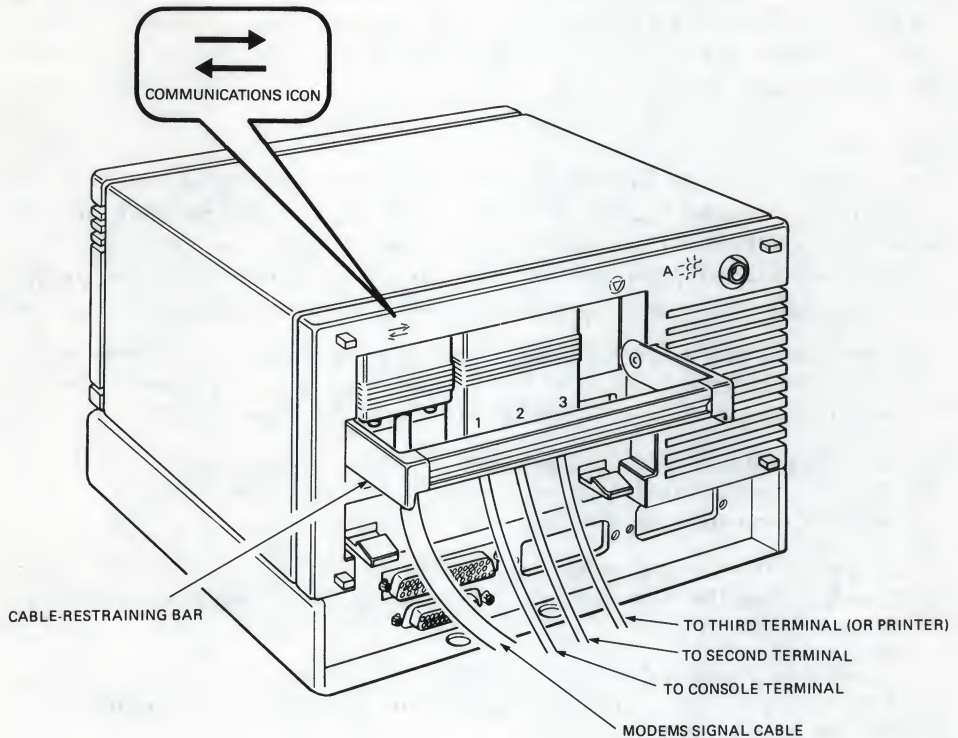
## **Install the Modem.**

A modem allows communication between the MicroVAX 2000 and another system over telephone lines. This section describes how to install the DF112, DF124, and DF224 modems. If a terminal is already connected to the communications port, you must remove the terminal to install the modem.

Refer to the documentation that shipped with the modem to complete the following procedures:

1. Unpack and set up the modem.
2. Follow the instructions that come with the modem to select and set the proper baud rate setting.
3. Locate the modem's 25-conductor cable (PN BCC04). If you do not already have this cable, you must order one from your sales representative.
4. Connect the 25-conductor cable to the modem's 25-pin connector.
5. If the cable-restraining bar on the rear of the MicroVAX 2000 system unit is not already raised, lift it up.

6. Connect the free end of the modem's 25-conductor cable to the communications port on the MicroVAX 2000 system unit (identified with the double-arrow icon).



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7. Tighten the thumbscrews on the modem's 25-conductor cable connector by turning them clockwise with your fingers.
8. Replace the cable-restraining bar by pressing it in with your fingers until it locks into place.



## **Install the Expansion Boxes.**

### **NOTE**

The cable-restraining bar on the rear of each expansion box can be used as a handle and should be used to carry the expansion box. However, do not place the expansion box on its front, as the drive door on the front of the box may be damaged.

### **CAUTION**

Only devices such as RD53-F and RD54-F expansion boxes, which were specifically designed for the MicroVAX 2000 or VAXstation 2000, may be attached to connector B of the expansion adapter. Likewise, devices such as RD53-F and RD54-F expansion boxes must not be connected to any device for which they were not designed, as circuit damage or data loss may occur.

The expansion box houses either a tape drive or a fixed-disk drive and is shipped with a drive cable. The drive cable connects the expansion box to the expansion adapter on the bottom of MicroVAX 2000 system unit.

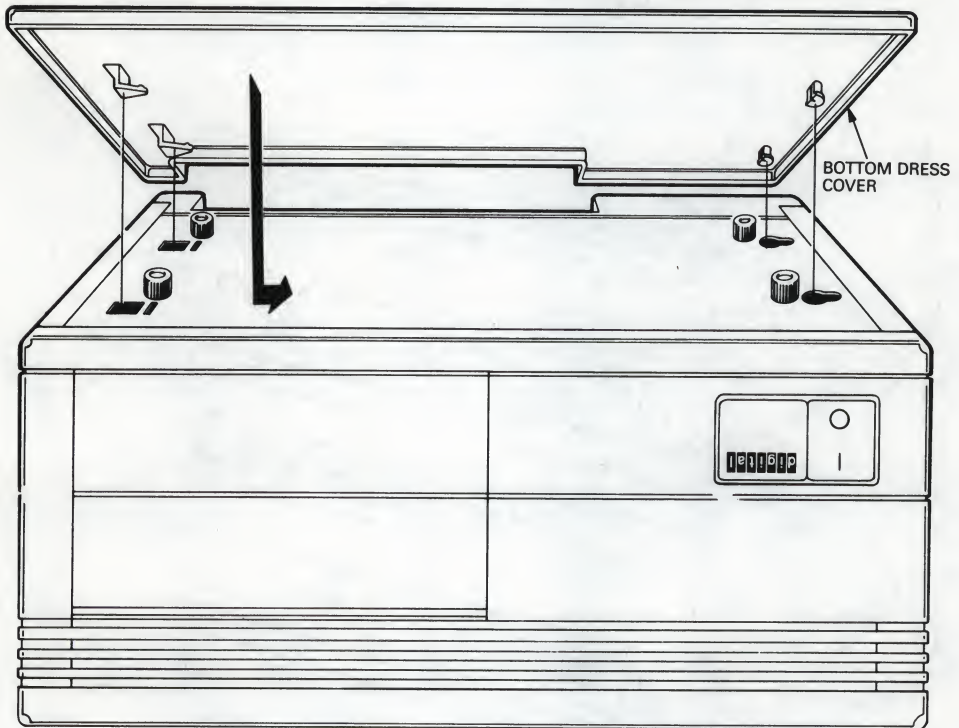
You may install a total of two expansion boxes (one with a fixed disk and one with a tape drive). If you are installing more than one expansion box, install the expansion box with the tape drive first.

You may set up the expansion box on top of the MicroVAX 2000 system unit, underneath the MicroVAX system unit, on its side (either side), or on its bottom rubber feet.

If you want to position the expansion box on its side, you should first install the bottom dress cover. To install the bottom dress cover, do the following: Otherwise, skip to step 3.

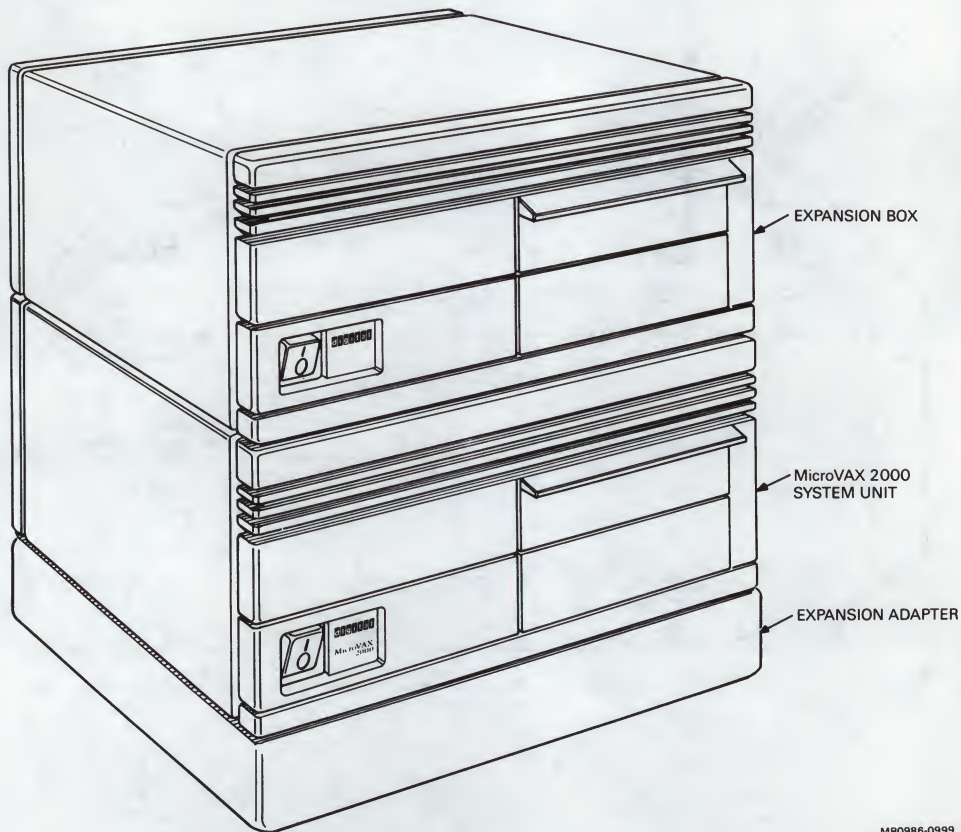
1. Place the expansion box upside down on a level surface.

2. Locate the bottom dress cover. Line up the molded inserts on the inside of the bottom dress cover over the holes on the bottom of the expansion box. Then slide the bottom dress cover until it locks into place.



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MA-1187-88

3. Place the expansion box on a level surface in one of the recommended positions. (The illustrations throughout this guide show one expansion box placed on top of the MicroVAX 2000 system unit. If you wish to position the expansion box in another position, follow the text and use the illustrations for reference.)



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Only one expansion box can be placed on top of the system unit. A second one must be placed underneath or next to the MicroVAX 2000 system unit.

**CAUTION**

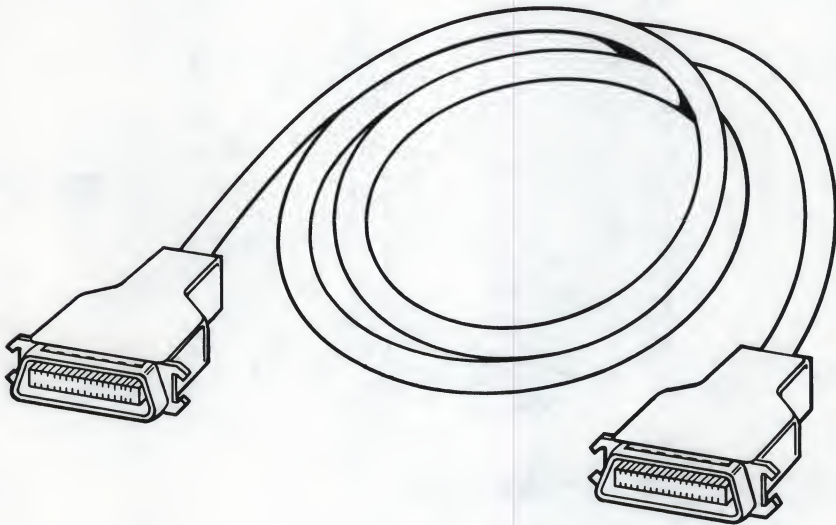
Do not place two expansion boxes on top of the MicroVAX 2000 system unit, as the system unit and internal printed circuit boards will be damaged.



If you are installing an expansion box with a tape drive, follow the instructions under Connect the Tape Drive Cable. If you are installing an expansion box with a disk drive, follow the instructions under Connect the Disk Drive Cable.

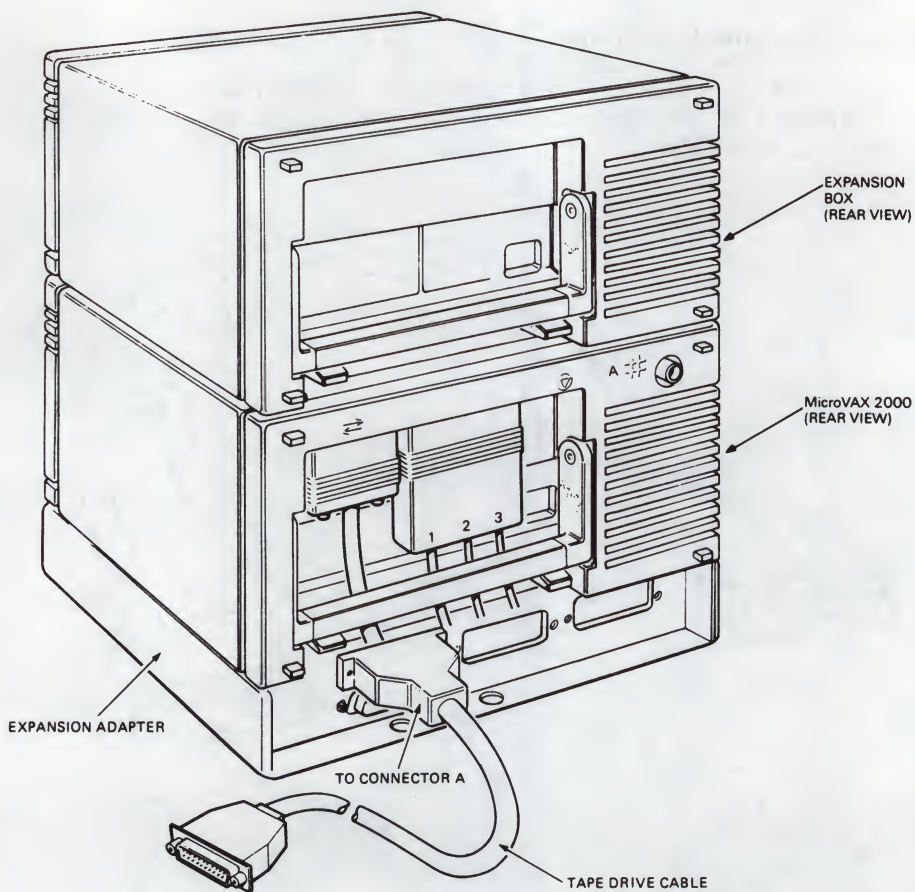
### **Connect the Tape Drive Cable.**

1. Locate the tape drive cable (PN BC19J). (The tape drive cable is available in different lengths; therefore, your tape drive cable may look different from the illustration.)

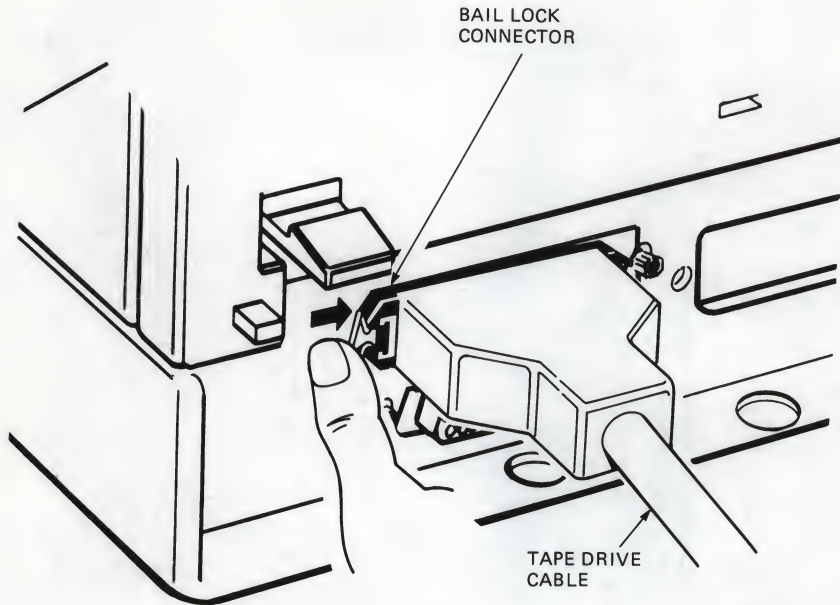


MR1086-1113  
MA-1109-88

2. Insert one end of the tape drive cable into connector A on the expansion adapter. (The two ends of the cable are identical and, therefore, interchangeable.)



3. Fasten the bail lock connectors on the tape drive cable connector by pressing them in with your finger.

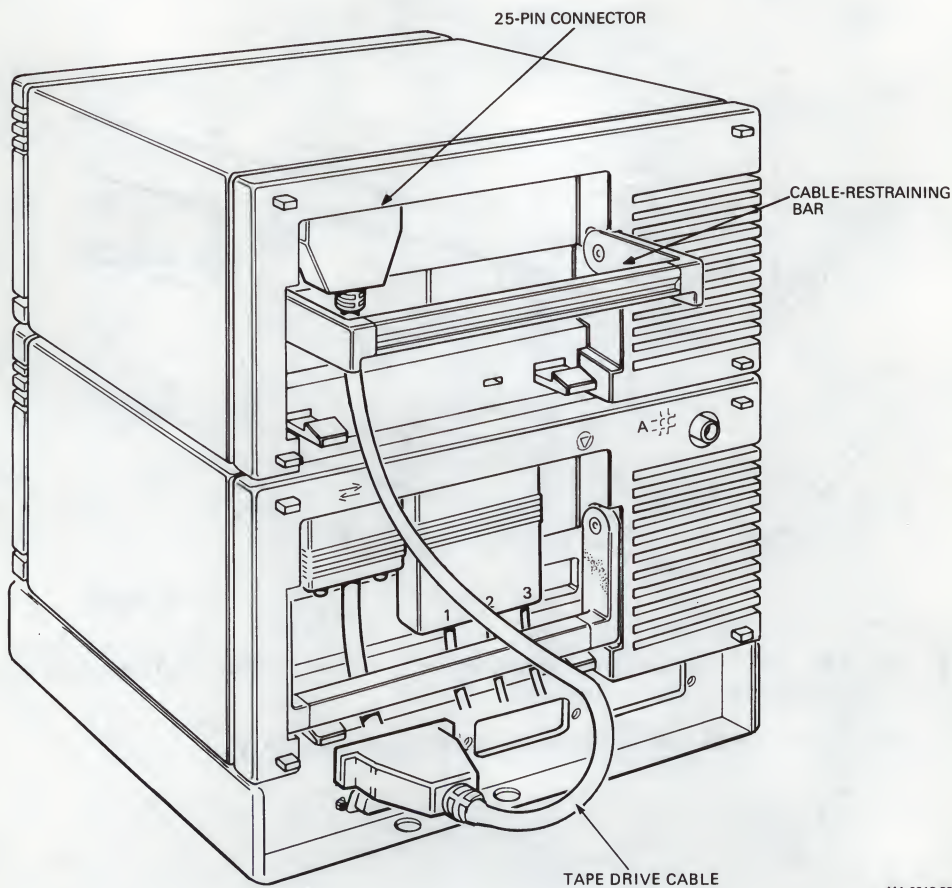


MA-0922-88

4. Press the cable-restraining bar on the rear of the system unit into place if you have not already done so.
5. Lift up the cable-restraining bar on the expansion box.



6. Insert the free end of the tape drive cable under the cable-restraining bar on the expansion box and into the 25-pin connector on the expansion box.

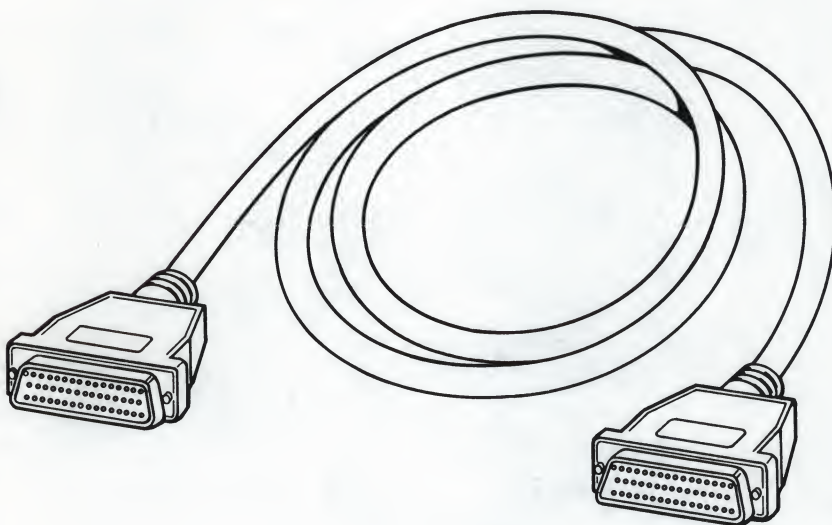


MA-0918-88

7. Fasten the bail-lock connectors on the tape drive cable connector by pressing them in with your finger.

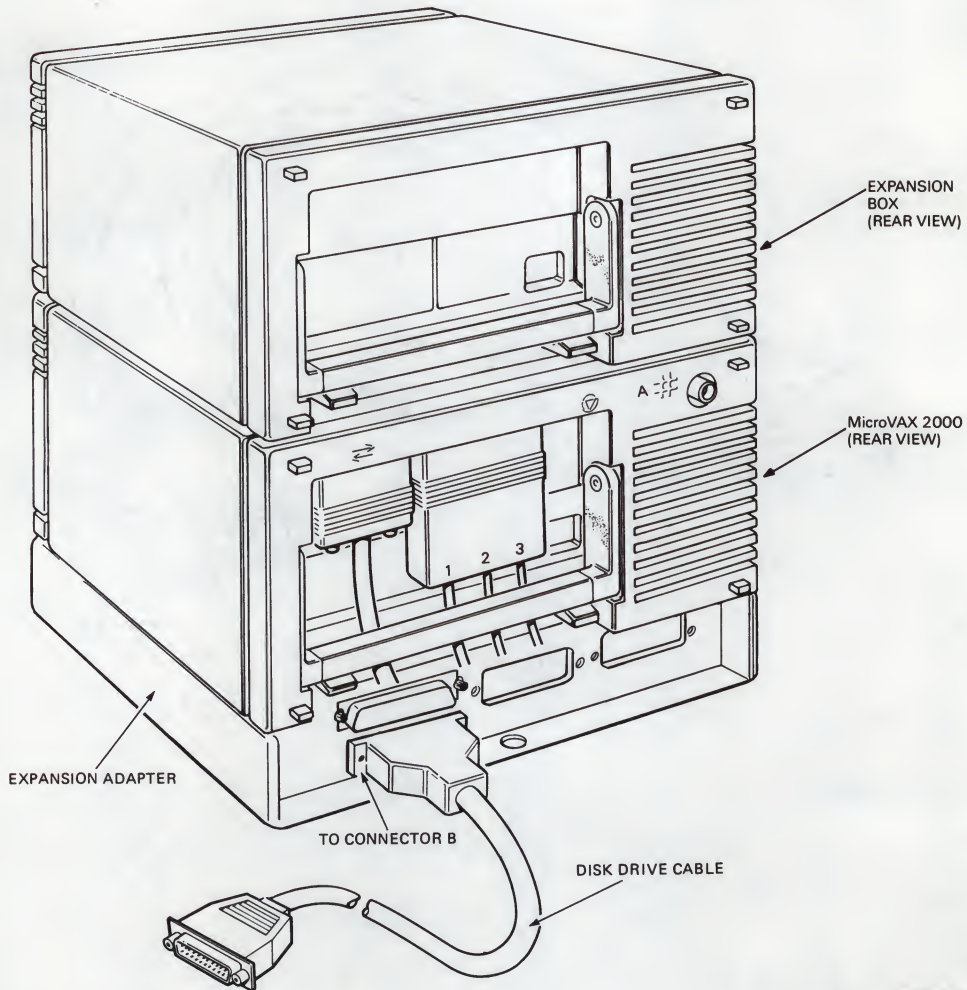
**Connect the Disk Drive Cable.**

1. Locate the disk drive cable (PN BC17Y). (The disk drive cable is available in different lengths; therefore, your disk drive cable may look different from the illustration.)



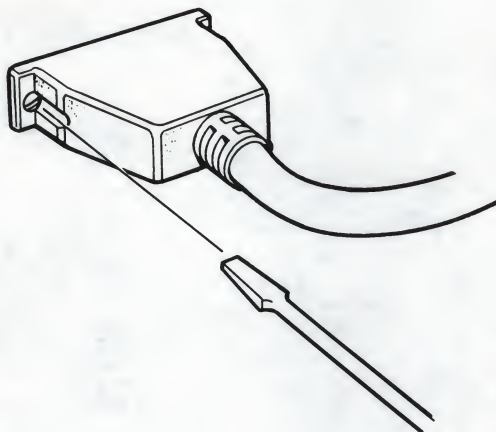
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MA-1119-88

2. Insert one end of the disk drive cable into connector B on the expansion adapter. (The two ends of the cable are identical and, therefore, interchangeable.)





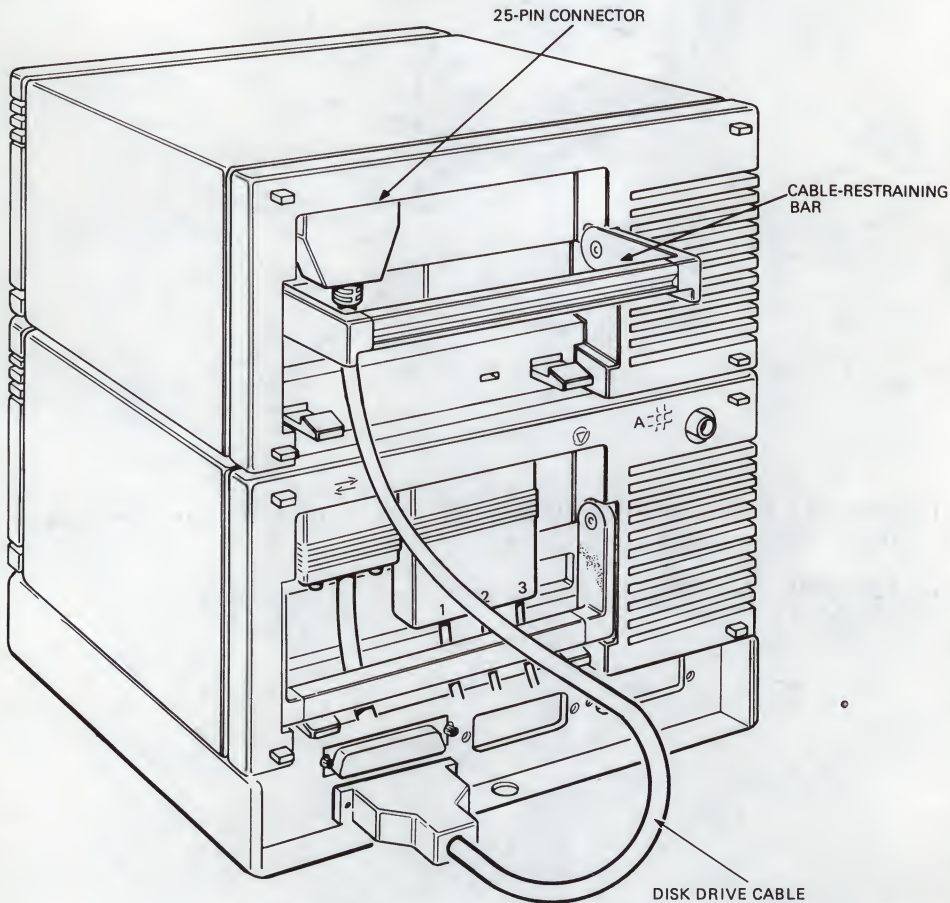
3. Use the flat-blade screwdriver you received with your shipment to turn the two cable connector screws clockwise.



MR0986-0993  
MA-1114-88

4. Press the cable-restraining bar on the rear of the system unit into place if you have not already done so.
5. Lift up the cable-restraining bar on the expansion box.

6. Insert the free end of the disk drive cable under the expansion box's cable-restraining bar and into the 25-pin connector on the expansion box.



7. Use the flat-blade screwdriver to turn the two cable connector screws clockwise to fasten the cable connector.

## Connect the DST32 Synchronous Serial Line Option

The DST32 serial line option for the MicroVAX 2000 provides one synchronous serial line for the MicroVAX 2000. The option contains one controller module, internal cabling, and one driver/receiver module with external cabling to connector C on the rear of the expansion adapter. In addition, an external cable is required for the connection of a host computer or modem to this serial line.

You can order a new system with this option already installed. If you want this option installed in a system already on your site, a qualified service representative must perform the installation of this option. After the option is installed, follow the directions in this section to make the external cable connections.

Complete the following steps to install the DST32 option:

1. Be sure you have the correct external cable(s) for your application. The following list shows the cables offered with the DST32 option. You should receive cables for only one type of communication protocol as part of your shipment. They are all 50-pin cables.
  - For RS232/V.24 communications: BC19V-02 cable and RS232C adapter connector
  - For RS422/V.36 communications: BC19U-02 cable
  - For RS423/V.10 communications: BC19W-02 cable

### NOTE

**If you plan to use a modem with your DST32 option, you must select an appropriate modem extension cable for your application.**

If you are using a modem with your system, make sure you have one of the cables shown in Table 1 below. If you need to order additional cables, contact your local Digital Sales representative.



**Table 1 Modem Cables for Each Communication Protocol**

Part Number	Communication Protocol
BC22F-XX <sup>1</sup>	Modem cable for V.24/RS232C
BC55D-XX <sup>2</sup>	Modem cable for V.10/RS423 and V.36/RS422

<sup>1</sup>Where XX = refers to the cable length in feet. The available cable lengths are: 10, 25, 35, 50, 75, A0 (100 ft), A5 (150 ft), B0 (200 ft), B5 (250 ft), B5 (250 ft).

<sup>2</sup>Where XX = refers to the cable length in feet. The available cable lengths are: 10, 25, 35, 50, 75, A0 (100 ft).

Table 2 below shows the relationship between data rate and cable length for the DST32.

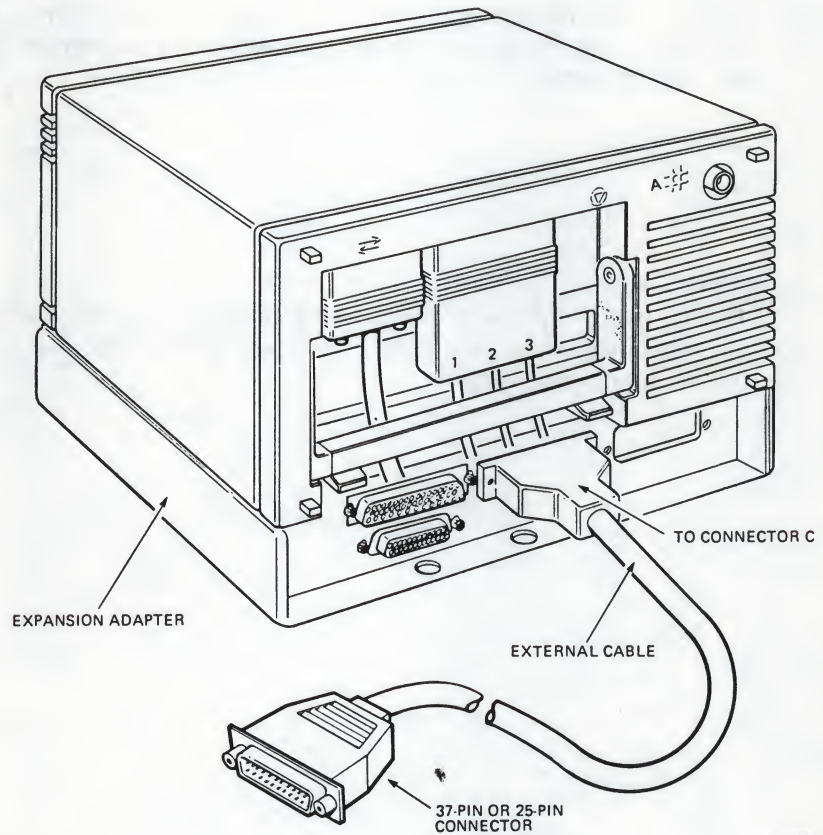
**Table 2 DST32 Data Rate for Cable Length**

Standard	Maximum Rate (Bit/s)	Maximum Cable Length	Cable Capacitance
RS232/V24 <sup>1</sup>	19.2 K	50 ft (16 m)	15 pF/ft
RS423/V10	9.6 K	1100 ft (330 m)	50 pF/ft
	19.2 K	600 ft (180 m)	50 pF/ft
RS422/V11	19.2 K	4000 ft (1200 m)	50 pF/ft

<sup>1</sup>If you are using RS232/V.24 communications, and want to connect a modem, you also need a BC22F modem cable. This is available in many lengths.

2. Power down all peripherals (terminals, expansion boxes, and printers) and the MicroVAX 2000 system unit.
3. Insert one end of the external cable into connector C on the back of the expansion adapter, as shown.
4. Insert the other end of the external cable into the appropriate connector on the host computer or modem that you want to connect.

5. Power up all terminals, expansion boxes, printer, and other peripherals connected to the MicroVAX 2000.



6. Power up the host computer and modem connected to the external cable.
7. Power up the MicroVAX 2000 system unit.

The console terminal (the one connected to connector 1 on the DEC423 converter on the back of the system unit) displays a message like the following:

KA410-A V2.2

F\_..E...D...C...B...A...9...8...7...6...5...4...3\_..2\_..1...

? C 0080 0000.4001

#### NOTE

The question mark and associated letters and numbers above are normal power-up indications in the MicroVAX 2000, and do not denote a failure.



8. At the console prompt >>> type TEST 50, and press Return. The console terminal displays configuration table like the following:

```

KA410-A  V2.2
ID 08-00-2B-02-CF-A4

CLK          0000.0001
NVR          0000.0001
? DZ         0000.4001
              00004001 00000001 00000001 00000000 00000000
MEM          0004.0001
              00400000
MM           0000.0001
FP           0000.0001
IT           0000.0001
HDC          1710.0001
              000146B8 00000000 00000320
TPC          0000.4001
              FFFFFFF03 FFFFFFF05 FFFFFFF05 FFFFFFF05 FFFFFFF05 FFFFFFF05
SYS          0000.0001
DST_32      0000.0001
NI           0000.0001

>>>

```

#### NOTE

The question mark associated with the DZ mnemonic is a normal power-up indication in the MicroVAX 2000, and does not represent a failure.

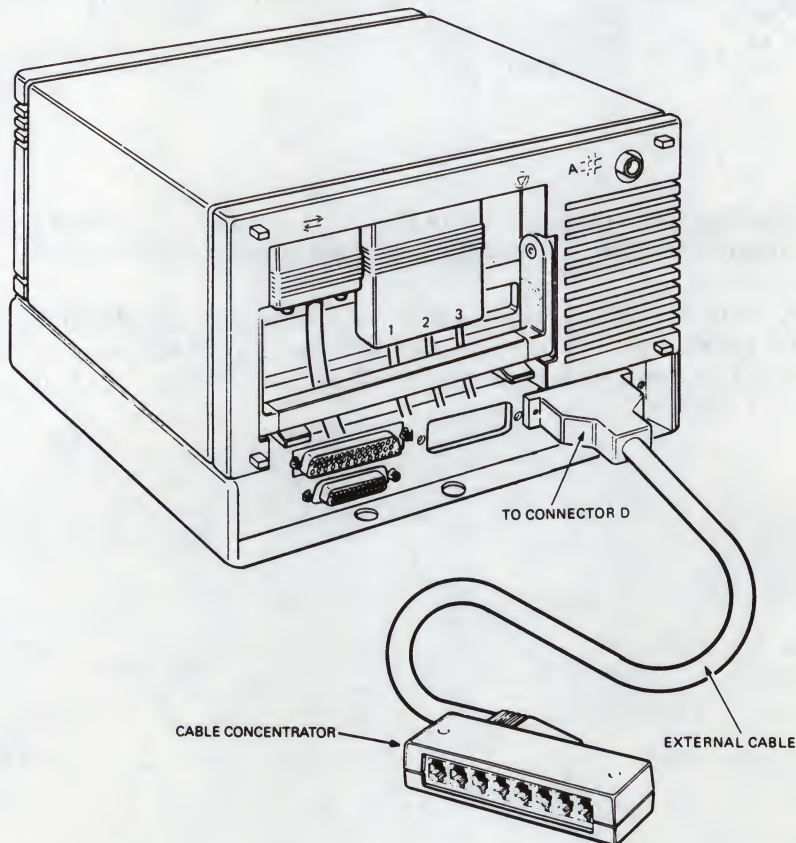
If you see the previous display, you have successfully completed the DST32 option installation. If you do not see the above display, review this document to make sure each step has been completed. Repeat the power up and TEST 50.

If your display still does not match the previous one, refer to the *MicroVAX 2000 Troubleshooting* for troubleshooting procedures.

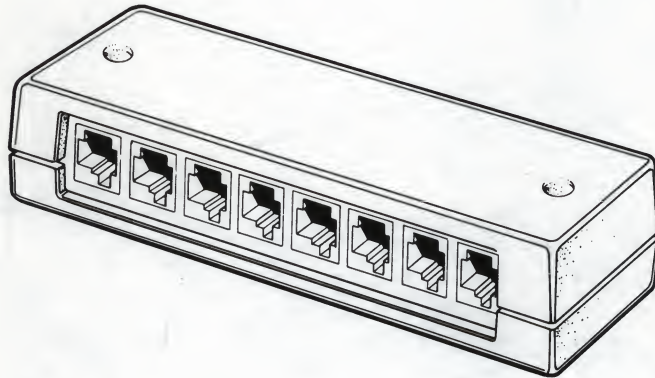
If you still have problems after installing this option, call a service representative.

### Connect the DHT32 serial line option

The DHT32 serial line option for the MicroVAX 2000 allows up to eight additional terminals to connect to the system, thus allowing up to eight additional users access to the MicroVAX 2000. The option contains one controller module, internal cabling, and one driver/receiver module with external cabling to connector D on the rear of the expansion adapter. Connection of one external cable and one cable concentrator on the MicroVAX 2000, as shown, enables the connection of additional terminals or other peripheral devices such as printers.



You can order a new system with this option already installed. If you want this option installed in a system already on your site, a qualified service representative must perform the installation of this option. After the option is installed, follow the directions in this section to install the external cable, cable concentrator (as shown), and additional terminals or other peripheral devices.

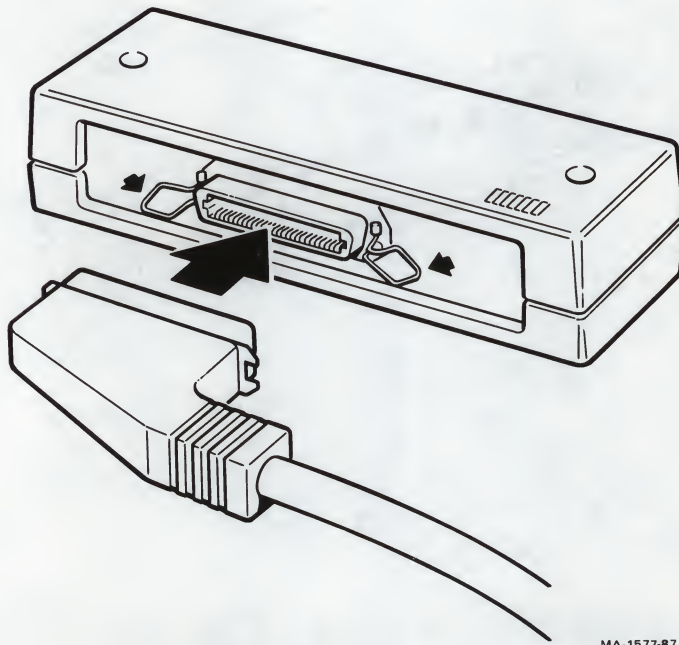


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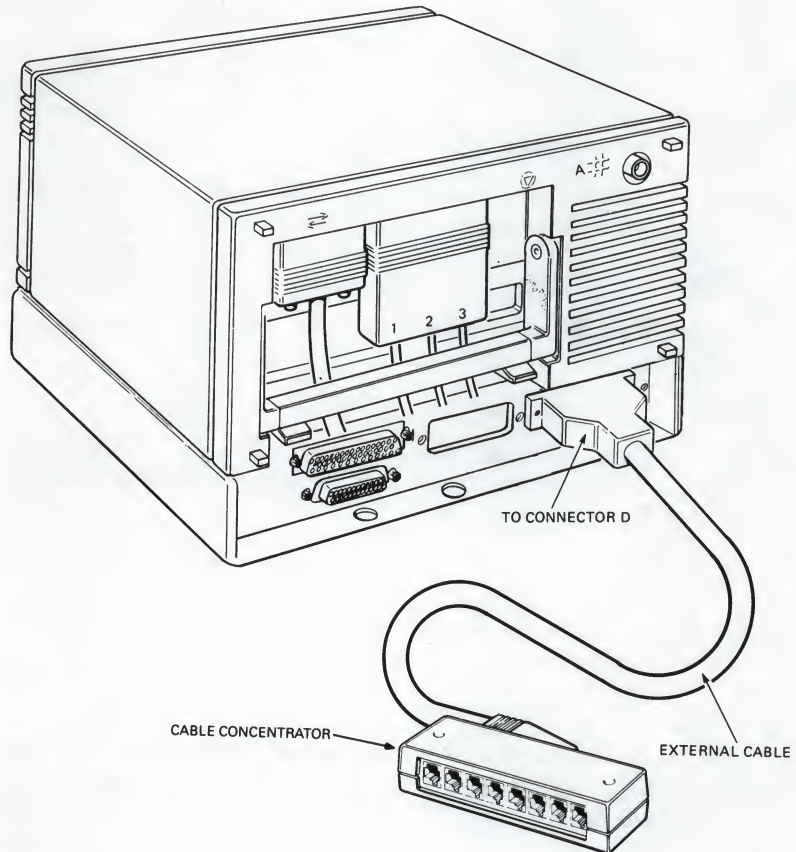
Complete the following steps to install the DHT32 option:

1. Power down all peripherals (terminals, expansion boxes, printer, and modem) connected to the MicroVAX 2000 system unit, and power down the system unit itself.
2. Insert one end of the external cable into the back of the cable concentrator, as shown. Latch the bail locks so that they secure the cable in place.



MA-1577-87

3. Insert the other end of the cable into connector D on the rear of the expansion adapter. Latch the bail locks so that they secure the cable in place.



4. Insert one end of each terminal (or other peripheral device) cable into one of the keyed jacks on the cable concentrator. You can connect up to eight terminals or other peripherals.

You may use a cable coupler (PN H8572) and additional lengths of DECconnect office cable to extend the cable to any terminal.

If a terminal or peripheral you want to connect does not have a DECconnect telephone-type connector on the back, use a 25-pin adapter (PN H8571A) on the back of the terminal. This provides the necessary connector compatibility.

After installation of the cable concentrator, your MicroVAX 2000 can accommodate up to 12 terminals. Four of the terminals connect to the rear of the system unit, as explained in the *MicroVAX 2000 Installation*. The remaining eight connect to the cable concentrator.

5. Power up all terminals and peripherals connected to the system unit and to the cable concentrator.
6. Finally, power up the MicroVAX 2000 system unit.

The console terminal (the one connected to connector 1 on the DEC423 converter on the back of the system unit) displays a message like the following:

```
KA410-A V2.2
F...E...D...C...B...A...9...8...7...6...5...4...3...2...1...
? C 0080 0000.4001
```

#### NOTE

The question mark and associated letters and numbers above are a normal power-up indication in the MicroVAX 2000, and do not denote a failure.



7. At the console prompt >>> type TEST 50 and press Return. The console terminal displays a configuration table like the following:

```
KA410-A V2.2
ID 08-00-2B-02-CF-A4

CLK          0000.0001
NVR          0000.0001
? DZ         0000.4001
00004001 00000001 00000001 00000000 00000000
MEM          0004.0001
00400000
MM           0000.0001
FP           0000.0001
IT           0000.0001
HDC          1710.0001
000146B8 00000000 00000320
TPC          0000.4001
FFFFFF03 FFFFFFF05 FFFFFFF05 FFFFFFF05 FFFFFFF05 FFFFFFF05
SYS          0000.0001
SLU          00FF.0001
NI           0000.0001

>>>
```

#### NOTE

The question mark associated with the DZ mnemonic is a normal power-up indication in the MicroVAX 2000, and does not represent a failure.

If you see the previous display, you have successfully completed the installation of the DHT32 option. If you do not see the previous display, review this document to make sure each step has been completed. Repeat the power up and TEST 50.

If your display still does not match the previous one, refer to the *MicroVAX 2000 Troubleshooting* for troubleshooting procedures.

If you still have problems after installing this option, call a service representative.

## **Connect the DSH32 Synchronous/Asynchronous Serial Line Option**

The DSH32 option is a synchronous/asynchronous serial line option that provides the MicroVAX 2000 system with one connector (connector C) for synchronous communication and one connector (connector D) for eight data-only asynchronous lines supporting a variety of protocols.

The DSH32 option consists of a controller module, internal cabling, and two driver/receiver modules with external cabling for connectors C and D on the rear of the system's expansion adapter.

You can order a new system with this option already installed. If you want this option installed in a system already on your site, a qualified service representative must perform the installation of this option. After the option is installed, perform the following procedures to make the correct external cable connections.

### **NOTE**

To install the DSH32 option in your system, you must have the BA40-BA expansion adapter. If you are unsure about which expansion adapter you have, check the pictures in this guide and look at the back of your system unit. The BA40-BA expansion adapter has two connectors (A and B) for tape and disk drives and metal plates covering two additional openings. If your system does not have the BA40-BA expansion adapter, contact your Digital sales representative.

Complete the following sequence of steps to connect the DSH32 option:

1. The DSH32 option comes with one 36-pin cable and a cable concentrator for asynchronous communication and one 50-pin cable for synchronous communication. The type of 50-pin cable you receive depends on the communication protocol you are using. Be sure you have the correct 50-pin cable(s) for your application. The following list shows the 50-pin cables that are available for use with the DSH32 option.
  - For RS232/V.24 communications: BC19V-02 cable and RS232C adapter connector
  - For RS422/V.36 communications: BC19U-02 cable
  - For RS423/V.10 communications: BC19W-02 cable

#### NOTE

If you plan to use a modem with your DSH32 option, you must select an appropriate modem extension cable for your application.

If you plan to connect a modem to the synchronous connector (connector C) of your system, make sure you have one of the cables shown in Table 3. If you need to order additional cables, contact your local Digital Sales representative.

**Table 3 Modem Cables for Each Communication Protocol**

Part Number	Communication Protocol
BC22F-XX <sup>1</sup>	Modem cable for V.24/RS232C
BC55D-XX <sup>2</sup>	Modem cable for V.10/RS423 and V.36/RS422

<sup>1</sup>Where XX = refers to the cable length in feet. The available cable lengths are: 10, 25, 35, 50, 75, A0 (100 ft), A5 (150 ft), B0 (200 ft), B5 (250 ft), B5 (250 ft).

<sup>2</sup>Where XX = refers to the cable length in feet. The available cable lengths are: 10, 25, 35, 50, 75, A0 (100 ft).



Table 4 below lists the data rate per cable length relationship for the DSH32.

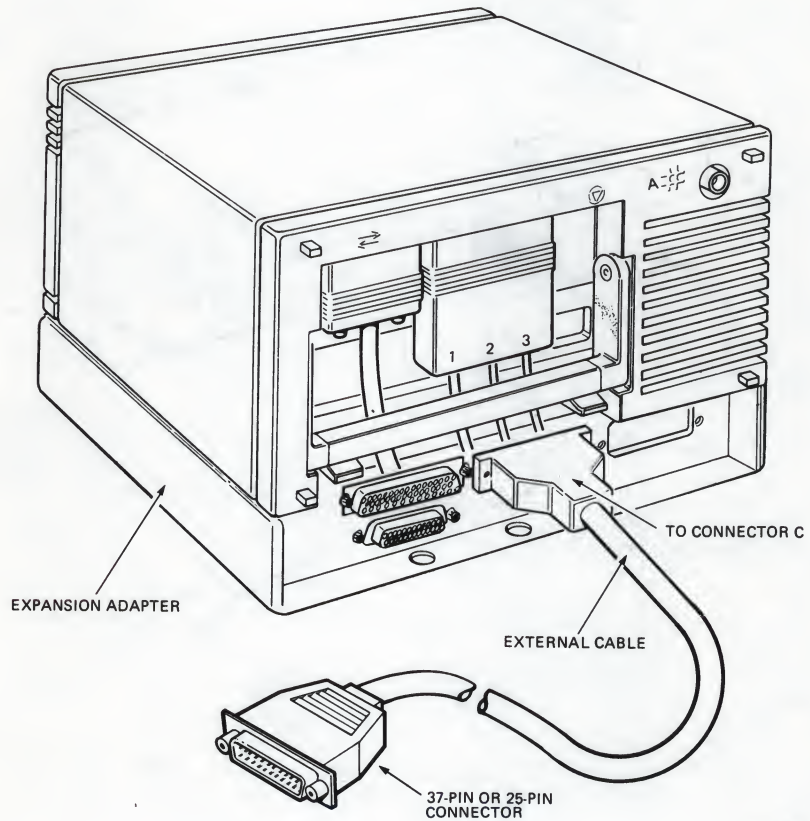
**Table 4 DSH32 Data Rate for Cable Length**

Standard	Maximum Rate (Bit/s)	Maximum Cable Length	Cable Capacitance
RS232/V24	19.2 K	50 ft (16 m)	15 pF/ft
RS423/V10	9.6 K	1100 ft (330 m)	50 pF/ft
	19.2 K	600 ft (180 m)	50 pF/ft
RS422/V11	19.2 K	4000 ft (1200 m)	50 pF/ft

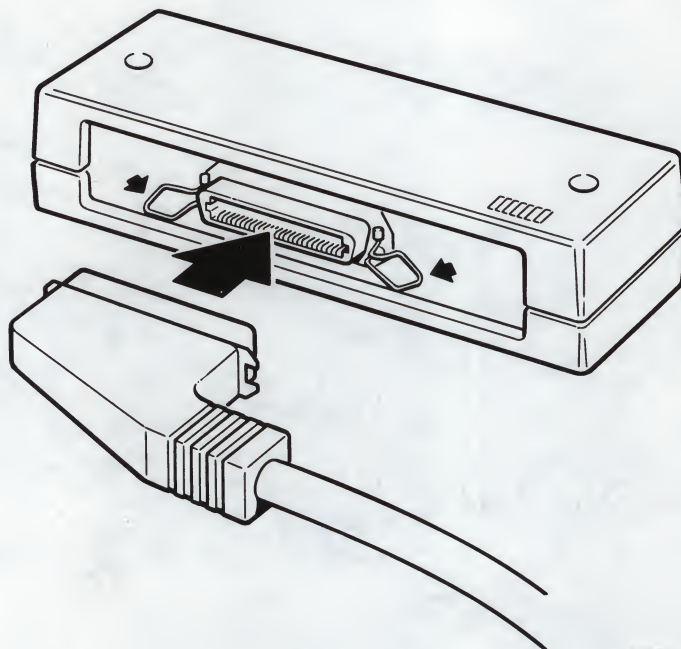
If you are using RS232/V.24 communications, and want to connect a modem, you also need a BC22F modem cable. This is available in many lengths.

2. Power down all peripherals (terminals, expansion boxes, and printers) and the MicroVAX 2000 system unit.
3. Connect the 50-pin cable to the synchronous connector (connector C) as follows:

- a. Insert one end of the external 50-pin cable into connector C on the back of the expansion adapter, as shown.
- b. Insert the other end of the external 50-pin cable into the appropriate connector on the host computer or modem that you want to connect.



4. Connect the 36-pin cable and cable concentrator to the asynchronous connector (connector D) as follows:
  - a. Insert one end of the external 36-pin cable into the back of the cable concentrator, as shown. Latch the bail locks so that they secure the cable in place.



MA-1577-87



- 



- c. Insert one end of each terminal (or other peripheral device) cable into one of the keyed jacks on the cable concentrator. You can connect up to eight terminals or other peripherals.

You may use a cable coupler (PN H8572) and additional lengths of DECconnect office cable to extend the cable to any terminal.

If a terminal or peripheral you want to connect does not have a DECconnect telephone-type connector on the back, use a 25-pin adapter (PN H8571A) on the back of the terminal. This provides the necessary connector compatibility.

After installation of the cable concentrator, your MicroVAX 2000 can accommodate up to 12 terminals. Four of the terminals connect to the rear of the system unit, as explained in the *MicroVAX 2000 Installation*. The remaining eight terminals connect to the cable concentrator.

5. Power up all terminals and peripherals connected to the system unit and to the cable concentrator.
6. Power up the MicroVAX 2000 system unit.

The console terminal (the one connected to connector 1 on the DEC423 converter on the back of the system unit) displays the following:

```
KA410-A V2.2
```

```
F...E...D...C...B...A...9...8...7...6...5...4...3...2...1...
```

```
? C 0080 0000.4001
```

#### NOTE

The question mark and associated letters and numbers are a normal power-up indication in the MicroVAX 2000, and do not represent a failure.

7. At the console prompt >>> type TEST 50 and press Return. The console terminal should display the following configuration table:

```

KA410-A V2.2
ID 08-00-2B-02-CF-A4

  CLK          0000.0001
  NVR          0000.0001
? DZ          0000.4001
    00004001 00000001 00000001 00000001 00000000 00000000
  MEM          0004.0001
    00400000
  MM           0000.0001
  FP           0000.0001
  IT           0000.0001
  HDC          1710.0001
    000146B8 00000000 00000320
  TPC          0000.4001
    FFFFFFF03 FFFFFFF05 FFFFFFF05 FFFFFFF05 FFFFFFF05 FFFFFFF05
  SYS          0000.0001
  DSH32-A      00FF.0001 V1.0
  DSH32-S      0000.0001 V1.0
  NI           0000.0001

>>>

```

#### NOTE

The question mark associated with the DZ mnemonic is a normal power-up indication in the MicroVAX 2000, and does not represent a failure.

If you see the previous display, you have successfully completed the installation of the DSH32 option. If you do not see the previous display, review this document to make sure each step was completed. Repeat the power up and TEST 50.

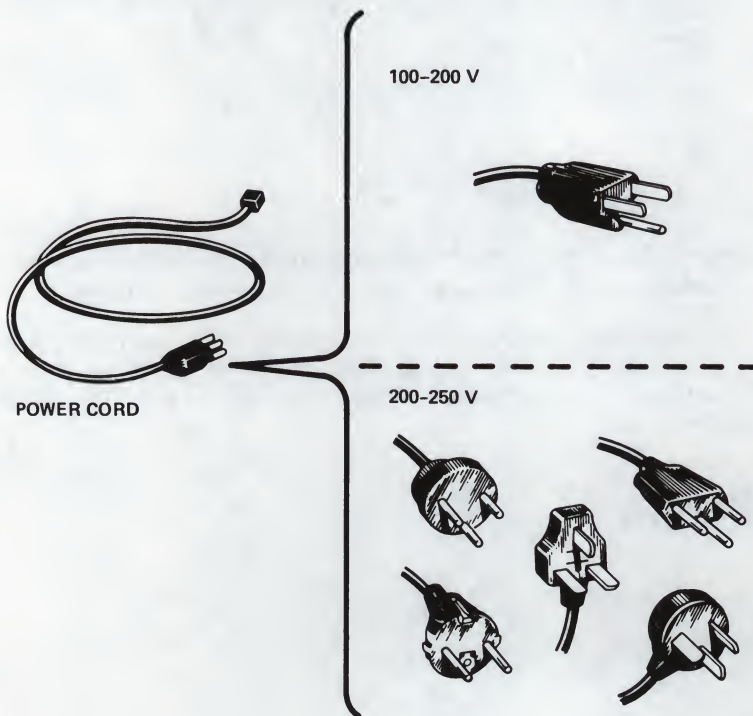


If your display still does not match the previous one, refer to the *MicroVAX 2000 Operation Addendum: DSH32 Synchronous/Asynchronous Serial Line Option* and *MicroVAX 2000 Troubleshooting* for troubleshooting procedures.

If you still have problems after installing this option, call a service representative.

## Connecting the Power Cords

1. Make sure the cable-restraining bars on the rear of the MicroVAX 2000 system unit and the expansion boxes are pressed down fully.
2. Locate the terminal power cord and system unit power cord. The two cords are the same type and interchangeable. Make sure that the plugs fit the wall outlet. If they do not, contact your sales representative.

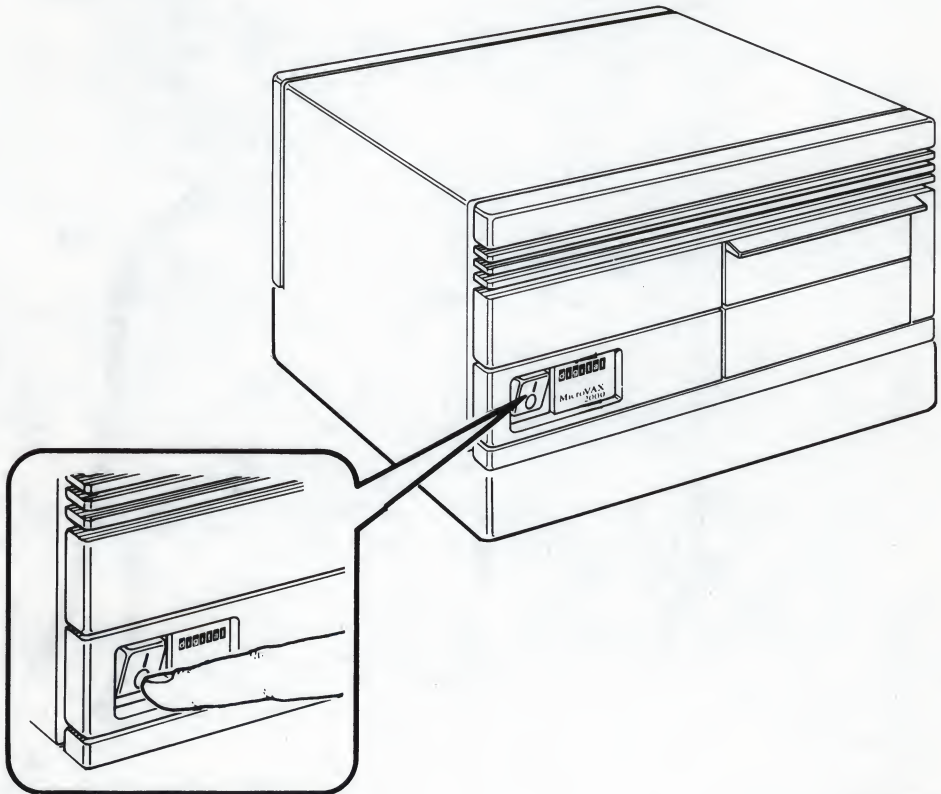


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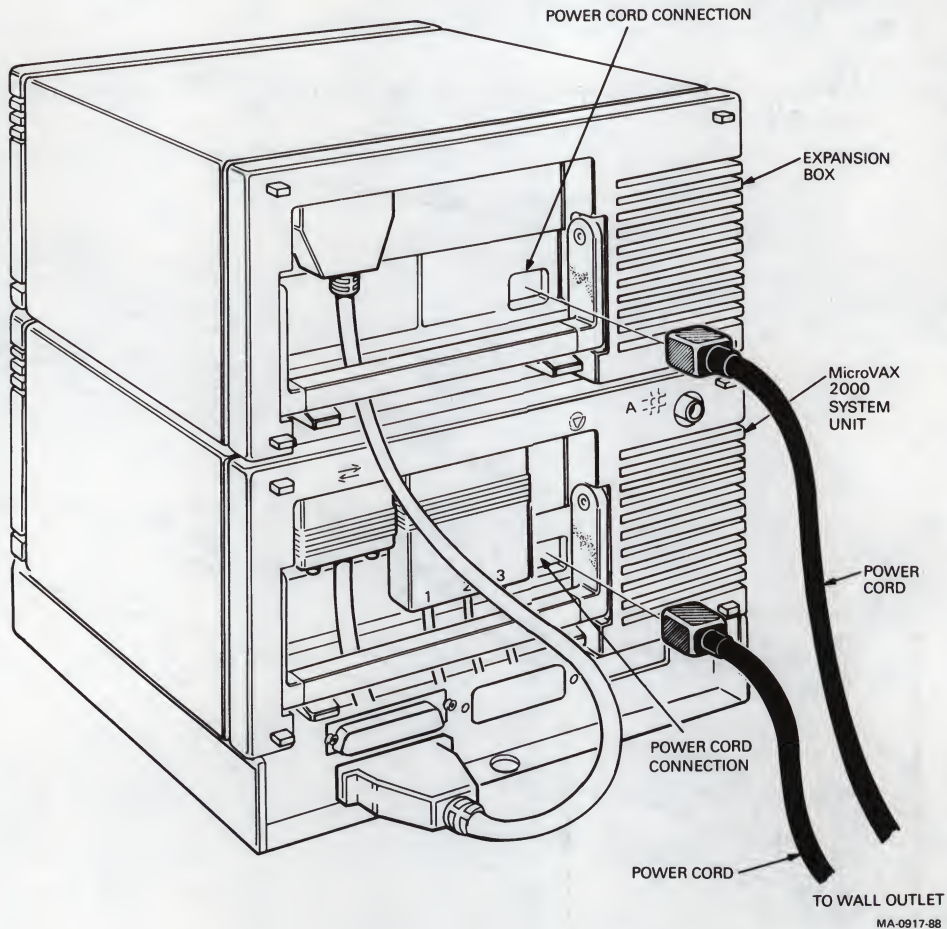
3. Make sure that the terminal's on/off switch is set to off (O).
4. Connect the terminal power cord to the terminal first and then to an outlet.

**WARNING:** Place the power and system cables in areas where no one will trip over them or step on them. Avoid straining or sharply bending the cables.

5. Make sure that the on/off switch on the MicroVAX 2000 system unit is set to off (O).



6. Connect the system unit's power cord to the system unit first and then to an outlet.
7. Make sure each expansion box on/off switch is also set to off (O). Then connect the expansion box power cords to each expansion box and then to an outlet.



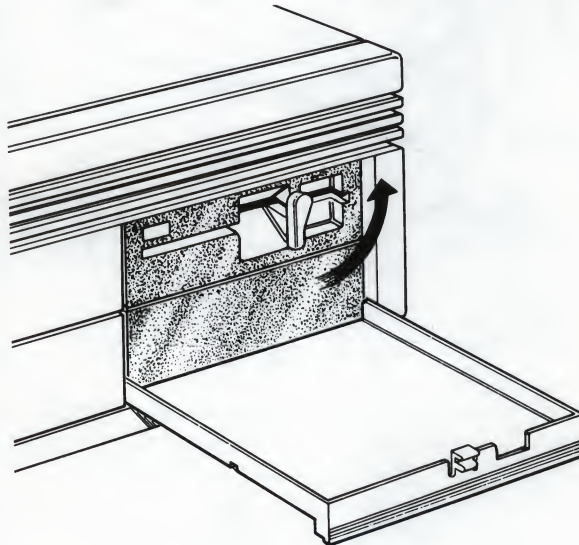


## Powering Up and Testing the MicroVAX 2000 System

The MicroVAX 2000 diagnostic tests are stored in MicroVAX 2000 read-only memory (ROM). At power-up, the MicroVAX 2000 automatically starts the system tests, which check the components of your system. The first time you power up your system, follow the steps in this section to ensure proper functioning of your MicroVAX 2000.

If your MicroVAX 2000 does not contain an RX33 diskette drive, skip to step 4.

1. Open the drive door on the front of the system unit by grasping the lip of the door and pulling.
2. Turn the lever on the diskette drive counterclockwise.

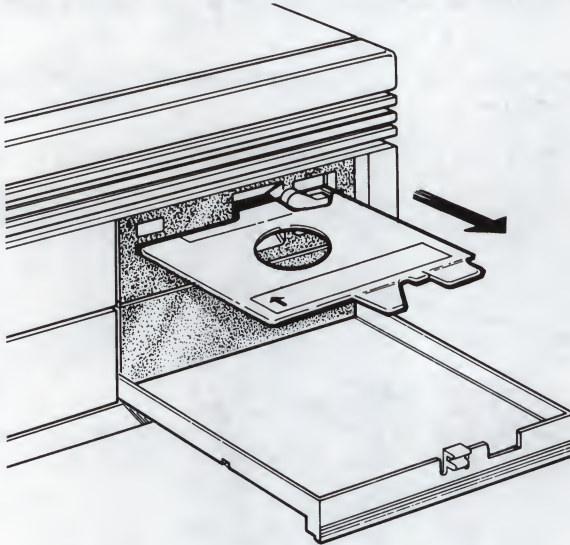


3. Remove the cardboard shipping insert and close the drive door.

### CAUTIONS

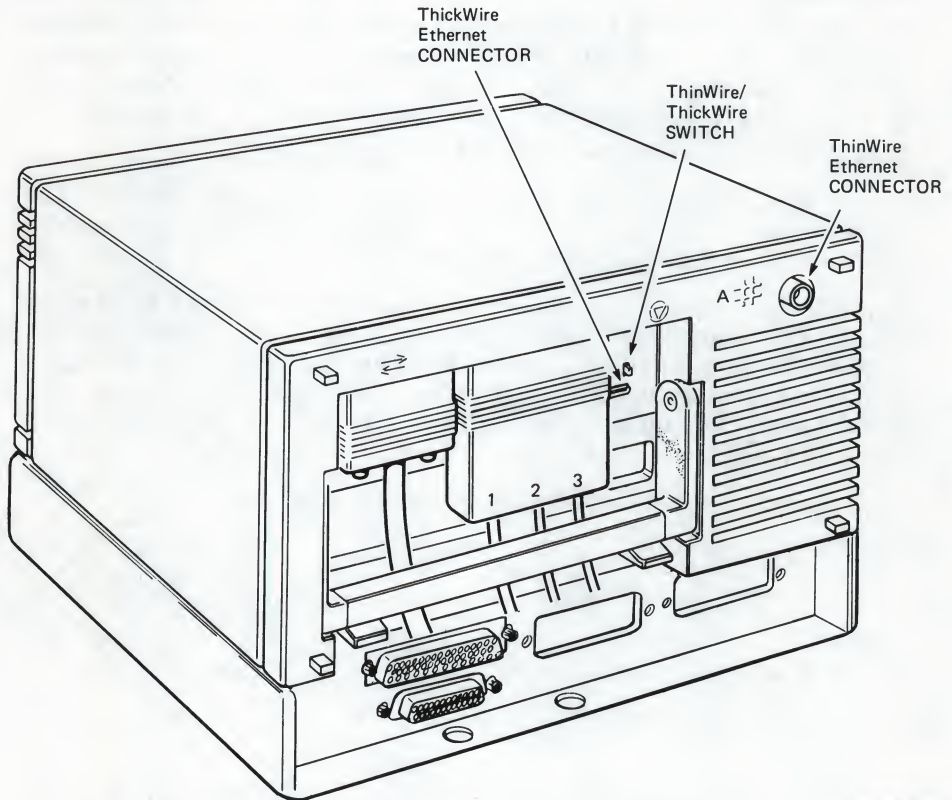
Do not try to return the lever to its original position. The lever will not move if there is nothing in the drive.

Operating the system without removing the shipping insert can damage the diskette drive.



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MA-1066-88

4. If your system has the network option installed, make sure you place the T-connector with the two BNC terminators over the ThinWire Ethernet Connector before you power on the system.



MA-0914-88

5. Power up the terminal by setting the terminal's on/off switch to on (I).
6. Power up any optional equipment (for example, printers and expansion boxes) by setting the on/off switches to on (I).



7. Power up the MicroVAX 2000 system unit by setting the system unit on/off switch to on (I).

### CAUTION

Do not power down the MicroVAX 2000 until power-up testing is complete. Wait until you see the console prompt >>> to power down. Powering down before testing is complete may destroy data in the system's memory. After you power down the system, wait at least 10 seconds before you power it on again.

A power-up display appears on the console terminal screen. The following three displays are examples of successful power-up displays. Some of these displays require user action.

Possible system problems are indicated by either one (?) or two question marks (??) on the console terminal screen. If ? or ?? appear and no explanation of a possible problem is given in the example, or if you do not see one of the following displays, review each installation step. Repeat the power-up procedure. If you still have trouble, refer to the *MicroVAX 2000 Troubleshooting*.

- a. You may see a display similar to the following:

```
KA410-A V2.2
F...E...D...C...B...A...9...8...7...6...5...4...3...2...1?...
? C 0080 0000.4001
? E 0040 0000.0005
? D 0050 0000.0005
? 6 00A0 0000.4001
?? 1 00C0 0000.7004
>>>
```

If the line showing ? E appears, the system time clock has not been set. When you install the operating system software, you will set the date and time.

If the line showing ? D appears, the battery charge is low. Once the system is powered up it will take about 17 hours for the battery to recharge.

If the line showing ? 6 appears, the diagnostics do not find a tape drive installed. If you do not have a tape drive installed, ignore this message. However, if you do have a tape drive installed, power down the MicroVAX 2000 system unit and review the tape drive installation steps (refer to Install the Expansion Box). If you still have trouble, refer to the *MicroVAX 2000 Troubleshooting*.

If the line showing ?? 1 appears, the test is indicating that the optional Ethernet module is installed in the system unit, but the external ThinWire Ethernet cable has not been installed yet. This is normal and does not indicate a fault. For information about connecting the system to the Ethernet, see Connecting the ThinWire or ThickWire Ethernet.

If the console terminal screen displays other system errors, refer to the *MicroVAX 2000 Troubleshooting*. If the screen displays only the system errors previously listed, proceed to Entering the Test Commands.

- b. Or, you may see a display similar to the following:

```
KA410-A V2.2
```

```
F...E...D...C...B...A...9...8...7...6...5...4...3...2...1?..
```

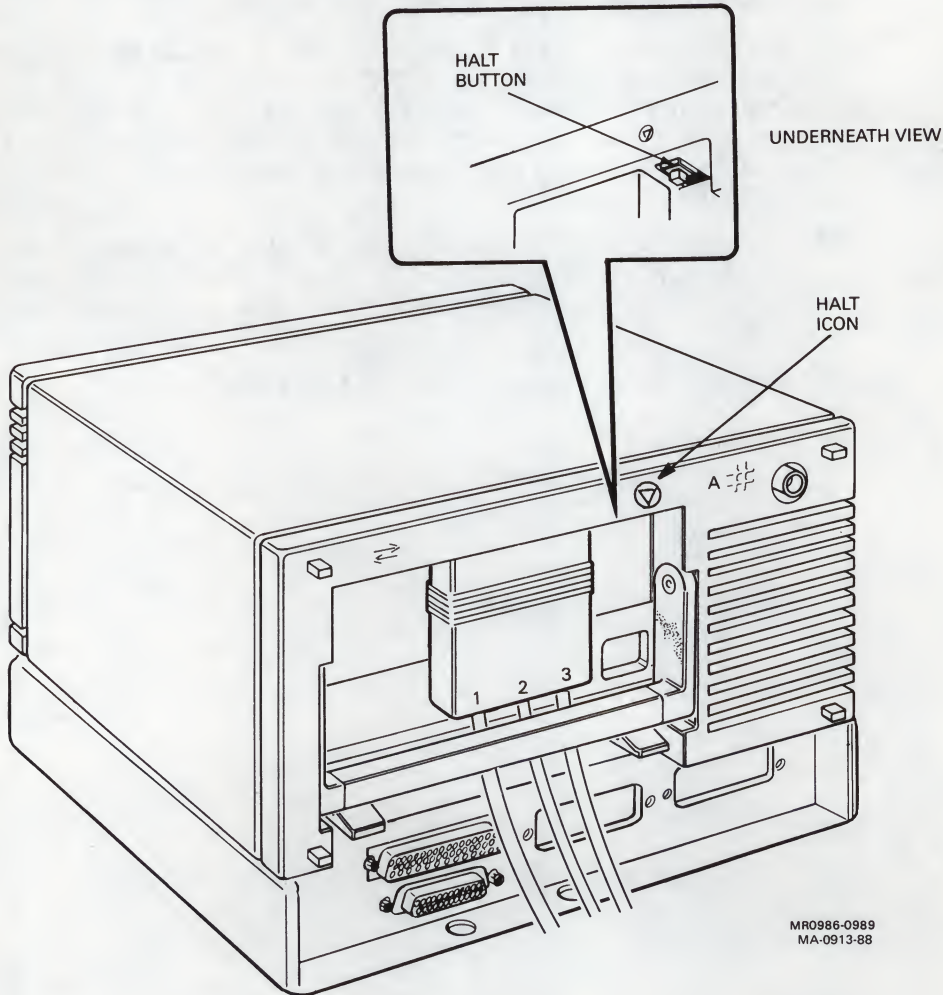
```
83 BOOT SYS
```

```
- DUA0
```

```
- ESA0
```

```
754 RETRY
```

The screen may also display the following device names: DUA1, DUA2, or MUA0. Press the halt button on the rear of the system unit to display the console prompt >>>. The halt button is identified with an encircled triangle (the halt icon).





After you press the halt button, you will see a display similar to the following:

```

?02 EXT HLT
      PC = 00001B46
>>>

```

This message means that the system was searching the network for the operating system software, but did not find it. This is normal, since you have not installed the networking hardware or operating system software yet. You will install these later in the installation process. Proceed to Entering the Test Commands.

- c. Or, you may see a display similar to the following:

```

KA410-A V2.2

F_..E...D...C...B...A...9...8...7...6...5...4...3...2...1?...

83 BOOT SYS
- DUA0

FATAL ERROR ROUTINE CALLED FROM PC = 0000072E
ERROR CODE = 000008C2
84 FAIL
>>>

```

The screen may also display one of the following device names: DUA1, DUA2, MUA0, or ESA0. This message indicates that the system did not find the operating system software on the device mentioned (DUA0 in this example). This is normal, since you have not installed the operating system software yet. You will install software later in the installation process.

8. Type **TEST 50** and press **Return**. The screen displays a list of devices contained in your system. The following is an example of a display. Your display may be different.

```
>>> TEST 50

KA410-A  V2.2
ID 08-00-2B-02-CF-A4

?CLK      0000.0005
NVR        0000.0001
DZ         0000.0001
00000001 00000001 00000001 00000001 00000001 000012A0
MEM        0002.0001
00200000
MM          0000.0001
FP          0000.0001
IT          0000.0001
HDC        1710.0001
000146B8 00000000 00000320
TPC        0000.4001
FFFFFFFF03 FFFFFFFF05 FFFFFFFF05 FFFFFFFF05 FFFFFFFF05 FFFFFFFF05 FFFFFFFF05
SYS 0000.0001
??NI       0000.7004

>>>
```

The devices are represented by the mnemonics listed in Table 5. Use the table to determine which devices are displayed and compare the devices listed on the screen to the devices that were installed with your system. If a ThinWire Ethernet module is not installed, the NI mnemonic will not be displayed.

If differences exist, review the installation procedures in this manual to make sure that every device has been received and properly connected. Repeat TEST 50. If differences still exist, check *MicroVAX 2000 Troubleshooting* for more information, or check with your service representative.

**Table 5 Definition of Mnemonics**

<b>Mnemonics</b>	<b>Device</b>
CLK	System clock
DZ	Serial line controller
FP	Floating point
HDC	Disk controller
IT	Interval timer
MEM	Memory
MM	Memory management
NI	Network interconnect module
NVR	Nonvolatile RAM
SYS	Interrupt controller and ThinWire Ethernet ID ROM
TPC	Tape controller

After your MicroVAX 2000 successfully completes the power-up tests, format the fixed-disk drive and set the default boot device before installing the operating system software.



## Formatting the Fixed Disk

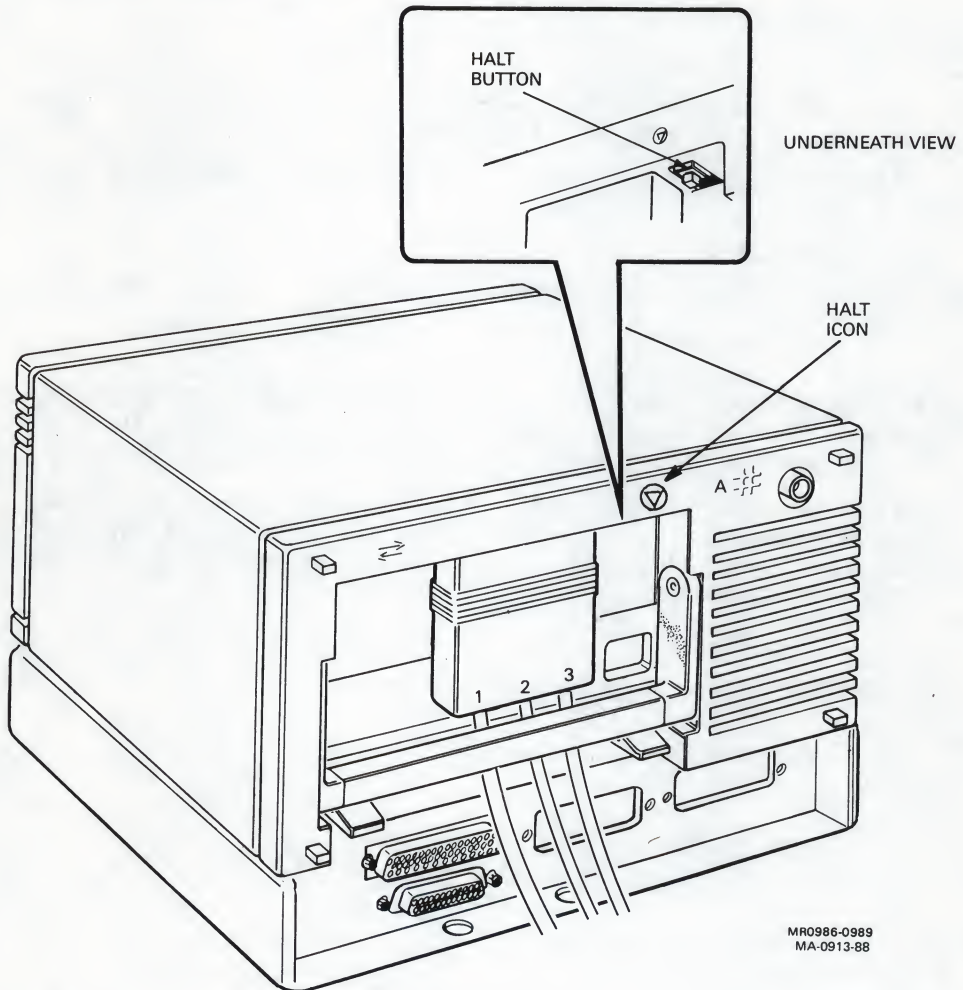
You must format each fixed disk in the system unit or in the expansion box. Formatting prepares the disk to accept data and must be done before the operating system software is installed or the files are stored.

**CAUTION:** Formatting a disk destroys stored software and data. If any software or data is already stored on the disk, back up your disk before formatting. If your disk is new, it should not have any information stored on it. (Refer to the operating system software documentation for disk backup procedures.)

To format a fixed disk, complete the following steps. If you are going to format more than one fixed disk, format the first fixed disk by completing the following steps. Then complete all the steps again to format the second fixed disk.

1. Check to be sure the system is in console mode. Console mode is indicated by the console prompt >>> on the monitor screen. After you have tested the MicroVAX 2000, it should be in console mode.

If the console prompt >>> does not appear on the screen, press the halt button on the rear of the system unit. The halt button is identified with an encircled triangle or halt icon.



2. At the console prompt >>>, type TEST 70 and press **Return**.

The following text appears on the console terminal screen:

```
KA410-A RDRXfmt
VSfmt_QUE_unitno (0-2) ?
```

3. Type the number 0 to format a fixed-disk drive in the system unit. Type the number 1 to format a fixed-disk drive in the expansion box.

If everything is working normally, the following text is displayed:

```
VSfmt_STS_Siz
```

If you have typed an incorrect number, the following text is displayed:

```
VSfmt_RES_ERR #1
```

If an error message occurs, start over at the first step of the formatting procedure. If you continue to see the error message, refer to the *MicroVAX 2000 Troubleshooting* for information on isolating and solving problems.

If the formatter is working successfully, the following text is displayed as the formatter program determines the type of fixed-disk drive you have selected for formatting. In the following example, the RD32 is the disk being formatted.

```
VSfmt_STS_Siz ..... RD32
```

If you see the following error messages:

```
VSfmt_STS_Siz .....??
```

or

```
VSfmt_RES_Err # 2
84 FAIL
>>>
```

there is a problem with the fixed-disk drive. Refer to the *MicroVAX 2000 Troubleshooting*, for information on isolating and solving problems. If the drive is formatting properly, the following is displayed:

```
VSfmt_QUE_SerNbr (0-999999999) ?
```



4. Type the serial number of the disk and press **Return**. The serial number is located on the packing slip. If there are any letters in the serial number, do not type them in; type only the numbers. Digital recommends that you type in the serial number, though you may type in any number. If you are formatting more than one fixed disk, you must assign a unique number to each disk. Be sure to save the number you assign to each disk for future use.

The following text is displayed:

```
VSfmt_QUE_RUsure (DUAX 1/0) ?
```

5. Type the number 1 and press **Return** to tell the formatting program to continue. If for any reason you do not want to continue, type any number other than 1. If you do this the formatter will stop and you will see the following message:

```
VSfmt_RES_Abtd
84 FAIL
>>>
```

If you choose to stop the formatter, you must restart at the first step of the formatting procedure when you are again ready to format a disk.

If you choose to continue, the following message is displayed gradually. It takes approximately 15 minutes to format an RD32 disk, 25 minutes to format an RD53 disk, and approximately 45 minutes to format an RD54 disk.

```
VSfmt_STS_RdMbb .....OK
VSfmt_STS_FMTing.....OK
VSfmt_STS_ChkPss.....OK
VSfmt_STS_BBRvec := x
VSfmt_RES_Succ
>>>
```

If you see this message in its entirety, the disk has been successfully formatted and is ready for use.

If there is a problem, one of the following two messages is displayed:

```
VSfmt_STS_Fmtng.....??  
VSfmt_RES_ERR #3  
84 FAIL  
>>>
```

or

```
VSfmt_STS_ChkPss 1.....??  
VS_RES_ERR #4  
84 FAIL  
>>>
```

If you see either of these messages, refer to the *MicroVAX 2000 Troubleshooting*, for information on isolating and solving problems.

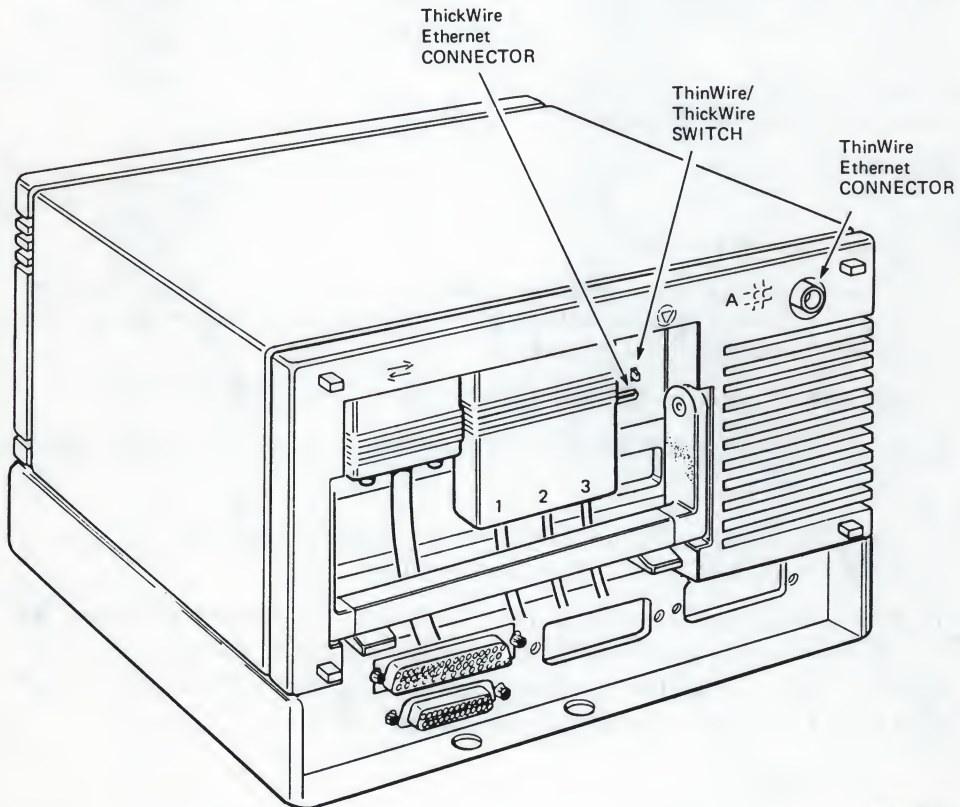
Proceed to Setting the Default Boot Device.

## Connecting the ThinWire or ThickWire Ethernet

You can connect your MicroVAX 2000 to a network through ThinWire Ethernet or ThickWire Ethernet. If your system contains the optional network module and connector, use the network guide (*VAXstation 2000*, *MicroVAX 2000*, and *VAXmate Network Guide*) that comes with your system to install the ThinWire or ThickWire Ethernet cable and other network hardware. You may also contact your service representative to install your network hardware.

### NOTE

If the optional network module is installed in your system, make sure you install the tee connector and BNC terminators from your hardware kit before you power on the system. If you connect your system to a ThinWire Ethernet cable, make sure the switch at the back of your system is set to ThinWire. If you connect your system to a ThickWire Ethernet cable, make sure the switch at the back of your system is set to ThickWire.





## Setting the Default Boot Device

The default boot device should be set when you determine where the operating system software is to reside. The MicroVAX 2000 then boots from that device at power-up. The operating system software can reside in one of the following places:

- on a fixed disk in the system unit
- on a fixed disk in the expansion box
- on a remote system that you access through the ThinWire Ethernet or standard Ethernet

The default boot device should be set to one of these. Table 6 shows the names assigned to each of the devices. (There are other possible devices, but the devices listed are for storing MicroVMS, VAX/VMS and ULTRIX operating system software.)

**Table 6 Boot Device Names**

Device and Location	Device Name
Fixed disk in system unit	DUA0
Fixed disk in expansion box	DUA1
Mass storage on remote system	ESA0

To set the default boot device:

1. Check to be sure the system is in console mode. If the console prompt >>> does not appear on the screen, press the halt button on the rear of the MicroVAX 2000 system unit.
2. At the console prompt, type **TEST 51**, then press **Return**.
3. Since no boot device has been selected yet, the following is displayed:

.... ? >>>

Type the name of the default boot device and press **Return**. Table 6 contains a list of default boot device names.

To change the default boot device to another device, type in the new boot device name and press **Return**. If you do not want to change the default device, press **Return**. To change the default boot device back to no default boot device, type in a period ( . ) and press **Return**.

## Where to Go from Here

### Install the Operating System Software

Before installing the operating system software, you should do the following:

1. Check with your system manager to determine the need to install operating system software on a fixed disk in your MicroVAX 2000 system unit or expansion box. If you will be using a host system through ThinWire or ThickWire Ethernet, you may not need to install operating system software.
2. Format any fixed disks as instructed in *Format the Fixed Disk*.
3. Choose the default boot device as instructed in *Set the Default Boot Device*.
4. Read the *MicroVAX 2000 Operation* to learn about system operation.
5. For systems using the ULTRIX operating system, set the terminals and printers for 7-bit ASCII. (Refer to the documentation that shipped with these devices.)

To install the MicroVMS, VAX/VMS or ULTRIX operating system software on the the MicroVAX 2000, follow the instructions that were shipped in the software carton. During the software installation, the operating system software is transferred from the installation medium (tape cartridge or diskette) to the fixed disk in the MicroVAX 2000 system unit or expansion box. You must have a tape drive or diskette drive in your MicroVAX 2000 system to load the software locally (as opposed to remotely, over the Ethernet network).

You may also remote-install the operating system software from another system over the Ethernet network onto your fixed disk. For information about remote installation of the MicroVMS operating system, refer to the *VAX/VMS Guide to Ethernet VAXclusters*. For information about remote installation of the ULTRIX operating system, refer to the *ULTRIX-32 Network Management Guide* and *ULTRIX-32 Basic Installation Guide for the MicroVAX 2000*.





# Index

---

## A

AC requirements, 2

## B

Baud rate

- console terminal, 10
- modems, 26
- printers, 24

Boot device

- changing the default, 76
- changing to no default, 76
- setting the default, 76

## C

Console terminal

- about, 13
- baud rate, 10
- installation, 10

## D

DHT32 serial line

- installing, 45

DSH32 Synchronous/Asynchronous  
Serial Line Option, 50

DST32 synchronous serial line  
installing, 39, 51

## E

Electrical requirements, 2

Environment

- humidity, 2
- temperature, 1

Ethernet

- ThickWire, 75
- ThinWire, 75

Expansion boxes

- installing, 28

## F

Fixed disks

- assigning unique number, 72
- formatting, 70
- stopping the formatter, 73

## M

Modems

- baud rate, 26
- installing, 26

## O

Operating system software

- installing, 77

Options

- additional DECconnect office  
cable, 24

- communication, 50

- DHT32 serial line, 44

- DSH32 asynchronous serial line,  
50

- DST32 synchronous serial line, 39

- expansion boxes, 28

- installing, 20

- modems, 26

- printers, 20

## P

Power Cords

- connecting, 58

Power-up

- displays, 64
- system tests, 61

Printers

- baud rate, 24
- installing, 16, 20
- operating, 24

**S**

Serial number

- formatting requirement, 72
- locating, 72

Shipment

- bottom cover, 5

- checking, 3

Site preparation, 1

- electrical requirements, 2
- environment, 1

Software

- installing, 77

**T**

Terminals

- console (see Console terminal), 14
- installing additional, 14

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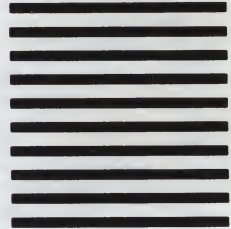
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